

1 UNITED STATES DISTRICT COURT
 2 EASTERN DISTRICT OF VIRGINIA
 ALEXANDRIA DIVISION

3 -----X
 4 UNITED STATES, et al., : Civil Action No.:
 : 1:23-cv-108
 5 Plaintiffs, :
 6 versus : Tuesday, September 24, 2024
 : Alexandria, Virginia
 7 GOOGLE LLC, : Day 12 p.m.
 : Pages 1-104
 Defendant. :
 8 -----X

9 The above-entitled bench trial was heard before the
 Honorable Leonie M. Brinkema, United States District Judge.
 10 This proceeding commenced at 2:00 p.m.

11 A P P E A R A N C E S:

12 FOR THE PLAINTIFFS: GERARD MENE, ESQUIRE
 OFFICE OF THE UNITED STATES ATTORNEY
 2100 Jamieson Avenue
 13 Alexandria, Virginia 22314
 (703) 299-3700

14 JULIA TARVER WOOD, ESQUIRE
 15 AARON TEITELBAUM, ESQUIRE
 16 RACHEL HANSON, ESQUIRE
 JEFFREY VERNON, ESQUIRE
 17 UNITED STATES DEPARTMENT OF JUSTICE
 ANTITRUST DIVISION
 450 Fifth Street, NW
 18 Washington, D.C. 20530
 (202) 894-4266

19 (State of VA) TYLER HENRY, ESQUIRE
 20 OFFICE OF THE ATTORNEY GENERAL
 OFFICE OF THE SOLICITOR GENERAL
 21 202 North Ninth Street
 Richmond, Virginia 23219
 22 (804) 786-7704

23
 24
 25 COMPUTERIZED TRANSCRIPTION OF STENOGRAPHIC NOTES

Rhonda F. Montgomery OCR-USDC/EDVA (703) 299-4599

A P P E A R A N C E S:

FOR THE DEFENDANT:

CRAIG REILLY, ESQUIRE
LAW OFFICE OF CRAIG C. REILLY
209 Madison Street
Suite 501
Alexandria, Virginia 22314
(703) 549-5354

KAREN DUNN, ESQUIRE
JEANNIE RHEE, ESQUIRE
WILLIAM ISAACSON, ESQUIRE
LEAH HIBBLER, ESQUIRE
PAUL, WEISS, RIFKIND,
WHARTON & GARRISON LLP
2001 K Street, NW
Washington, D.C. 20006
(202) 223-7300

COURT REPORTER:

RHONDA F. MONTGOMERY, CCR, RPR
Official Court Reporter
United States District Court
401 Courthouse Square
Alexandria, Virginia 22314
(703) 299-4599
RMontgomery@courtreport.net

1	TABLE OF CONTENTS
2	WITNESSES
3	On behalf of the Defendant:
4	PAUL MILGROM
5	Cross-examination by Mr. Vernon ...4
6	Redirect examination by Ms. Rhee ..25
7	Recross-examination by Mr. Vernon .41
8	PER BJORKE
9	Direct examination by Ms. Morgan ..42
10	Cross-examination by Mr. Freeman ..81
11	Redirect examination by Ms. Morgan 96
12	Recross-examination by Mr. Freeman 100
13	KENNETH BLOM (video).....102
14	MISCELLANY
15	Proceedings September 24, 2024
16	Certificate of Court Reporter
17	
18	
19	
20	
21	
22	
23	
24	
25	

Cross-Examination - P. Milgrom

P R O C E E D I N G S

MR. FREEMAN: Welcome back.

May I proceed?

THE COURT: Please.

THE WITNESS: Good afternoon.

CROSS-EXAMINATION (Resumed)

BY MR. VERNON:

Q Let's turn to first look. Going first can give AdX an advantage over other exchanges, correct?

A Advantages and disadvantages, yes.

Q You used the analogy of a clothing sale. Do you remember that?

A I did, yes.

Q Under that analogy, there are some buyers that get the chance to buy first?

A Yes.

Q And then the later buyers don't get to see all of the inventory; is that right?

A That's what my example was, yes.

Q So what can happen is the buyer that goes first can get the best inventory; is that right?

A They can get the deals that are best for them.

Q And then the later buyers might miss out on the best clothing because it's already been purchased, correct?

A It could be the ones that are best for them are gone,

Cross-Examination - P. Milgrom

1 yes.

2 Q And that's the advantage of going first, right?

3 A That's right.

4 Q Let's turn to, in your binder, PTX 308, which the
5 United States will move to admit.

6 THE COURT: Any objection to 308?

7 MR. VERNON: It's towards the beginning, the
8 second one.

9 MS. RHEE: No objection, Your Honor.

10 THE WITNESS: Okay.

11 BY MR. VERNON:

12 Q This is a series of emails involving some Google
13 employees. Do you see that?

14 A Well, it's all printed over here. Let's see. Yes, I
15 see that it's between two Google employees.

16 Q Let's focus on the second email from the top from
17 Michelle Sarlo Dauwalter, in particular, the part in the
18 first paragraph after "Rubicon strategy."

19 Do you see that?

20 A Rubicon strategy, yes.

21 Q This says, "Rubicon is pitching header bidding to
22 several of our partners because DRX" -- and DRX refers to
23 DFP, right?

24 A It can, yeah.

25 Q -- "DRX has historically made it difficult for SSPs to

Cross-Examination - P. Milgrom

1 compete on a level playing field with AdX. (Publishers have
2 historically had to book an average CPM rate which would not
3 allow for Rubicon to compete effectively for higher-value
4 impressions.)"

5 A I see it, yeah.

6 Q And Rubicon at this time was another exchange?

7 A Well, 2016, yeah.

8 Q And so this email is saying that first look would not
9 allow Rubicon, the other exchange, to compete effectively
10 for higher-value impressions?

11 A That's what it says, yes.

12 Q And that's consistent with what we just walked through
13 about clothing where the first buyer can buy the clothing
14 that's best and the later buyers don't get it. Correct?

15 A The first buyer can buy clothing that's best for it,
16 right.

17 Q This email describes first look as being an advantage
18 for AdX; is that correct?

19 A It seems to, yes, this part of it that we've read.

20 Q And you said that first look would create a mix of
21 advantages and disadvantages; is that right?

22 A That's right.

23 Q This email -- I won't ask you to look at the whole
24 thing, but at least these two paragraphs we're looking at,
25 they do not describe first look as a disadvantage for AdX,

Cross-Examination - P. Milgrom

1 correct?

2 A Well, I see. "But" -- and that's in boldface -- "tends
3 to transact at higher CPMs." That's the disadvantage for
4 AdX buyers. It's right there in the second paragraph.

5 Q Doesn't that refer to header bidding?

6 A No, I don't think so.

7 Q It says, "Overall, we believe that HB" -- that refers
8 to header bidding?

9 A I'm looking at the next sentence. It says, "This tends
10 to mean that AdX loses matched impression share on pubs that
11 implement HB, but trends to transact at higher CPMs."

12 Q Even the sentence that you're reading refers to header
13 bidding? That's the HB?

14 A It does refer to the header bidding as to modify which
15 impressions AdX uses.

16 Q And the first look, you're aware, is about the
17 pre-header bidding time period?

18 A We're talking about first look. Oh, we're talking
19 about first look now.

20 Q First look.

21 A Right. We're talking about the first look period. So
22 I'm not sure why I'm reading this paragraph then. Okay.

23 Q Okay. So this document does not describe first look as
24 a disadvantage for AdX; is that correct?

25 A Right. The only paragraph I see that's relevant is the

Cross-Examination - P. Milgrom

1 one you highlighted, yes.

2 Q Let's turn to PTX 551, which has already been admitted.

3 A Okay.

4 Q Let's focus on the email from Ms. Dauwalter starting
5 with the second paragraph.

6 MS. RHEE: I'm sorry. This is 501?

7 MS. WOOD: 551.

8 MS. RHEE: Okay. Sorry. Thank you. I misheard.

9 BY MR. VERNON:

10 Q The second full paragraph three lines from the bottom,
11 "Our buyers enjoy a competitive advantage from dynamic
12 allocation because they receive first look on inventory."

13 Do you see that?

14 A I see that, yes.

15 Q And then in the next paragraph, it writes, the first
16 line, "Launching AdX into a non-DFP server destroys this
17 competitive first look advantage and would most likely lead
18 to AdX (1) losing access to overall queries, and (2) losing
19 access to highest-value queries."

20 Do you see that?

21 A I do see that, yes.

22 Q And highest value is in italics. Do you see that?

23 A I do, yes.

24 Q So this email is describing first look as giving AdX an
25 advantage for the, quote, highest-value queries; is that

Cross-Examination - P. Milgrom

1 right?

2 A It does describe it that way, yes.

3 Q And you can set that one aside. I will just do one
4 more.

5 Let's go to 1650, which has already been admitted.
6 It's a document from The Trade Desk.

7 A All right.

8 Q The Trade Desk is one of the largest DSPs along with
9 Google's DV360; is that right?

10 A It is one of the largest, yes.

11 Q Let's turn to page 6 titled Google's Position Before
12 Header Bidding.

13 A Yes.

14 Q The second half box, half circle reads, "Google's SSP
15 was tightly integrated with its ad server, allowing
16 preferential access to ad inventory before other SSPs."

17 Do you see that?

18 A I do, yes.

19 Q That describes first look?

20 A It seems to, yes.

21 Q The next square/circle says, "As a result, Google had a
22 significant competitive advantage in the programmatic ad
23 market."

24 Do you see that?

25 A I do, yes.

Cross-Examination - P. Milgrom

1 Q So this is another document that describes first look
2 as giving an advantage to AdX, correct?

3 A Yes.

4 Q This document does not say first look created a
5 disadvantage for AdX, correct?

6 A It does not say that.

7 Q Okay. You can set that document aside.

8 First look could be described as a right of first
9 refusal; is that right?

10 A I don't think so, no.

11 Q Okay. Well, we'll agree to disagree on that one.

12 You agree that a right of first refusal can reduce
13 competition, correct?

14 A Yes, I do agree that that's possible.

15 Q But you express no opinion about whether first look
16 reduced competition among exchanges; is that correct?

17 A I expressed no opinion about that, right.

18 Q So you expressed no opinion about whether any harm to
19 competition from first look is larger or smaller than any
20 benefits that could result from first look, correct?

21 A I did not express an opinion. That's correct.

22 Q On your direct, you talked about the innovation that
23 was involved in dynamic allocation. Do you remember that?

24 A Yes.

25 Q Dynamic allocation did not allow multiple exchanges to

Cross-Examination - P. Milgrom

1 bid against each other simultaneously, correct?

2 A No, but dynamic allocation was an AdX program. That
3 did not. That's right.

4 Q Allowing multiple exchanges to bid simultaneously
5 against each other was something that came from header
6 bidding; is that right?

7 A Header bidding did allow that, yes. That was the first
8 to allow it.

9 Q And header bidding was not created by Google; is that
10 right?

11 A That's right.

12 Q Header bidding was introduced by other companies; is
13 that correct?

14 A Yes.

15 Q Other companies introduced header bidding years before
16 Google introduced its own version of simultaneous
17 competition being open bidding; is that correct?

18 A Well, open bidding emerged a couple of years after
19 header bidding became popular. I'm not sure when header
20 bidding was first available.

21 Q But header bidding was before open bidding, right?

22 A Yes. Absolutely, yes.

23 Q Okay. Header bidding had some downsides. I think you
24 referred to that on your direct.

25 A Yes.

Cross-Examination - P. Milgrom

1 Q But the industry introduced header bidding because it
2 needed a way around the fact that dynamic allocation only
3 allowed other exchanges to compete after AdX was the first
4 one to run its real-time auction, correct?

5 A Header bidding had several things that were associated
6 with it, but that was one of them.

7 Q Okay. Let's turn to Project Poirot. On your direct,
8 you talked about whether Google intended to limit or
9 interfere with or dry up header bidding when it did Project
10 Poirot; is that right?

11 A I talked about intent since I don't try to be a mind
12 reader. But I testified that it had other reason to -- good
13 reason to implement Poirot.

14 Q You do offer the opinion in your report that the design
15 of Poirot is inconsistent with an intent to drive header
16 bidding; is that right?

17 A Yes.

18 Q And you think that a bidder that was trying to dry up
19 another exchange would choose not to bid on that exchange at
20 all; is that right?

21 A I think there's -- that's one possible strategy, lots
22 of possible strategies.

23 Q You did write that in your report. You wrote a bidder
24 seeking to, quote, dry up an exchange might choose not to
25 bid at all, but that is not the effect that Poirot had.

Cross-Examination - P. Milgrom

1 Do you remember that?

2 A Yes. Now that you remind me, I remember.

3 Q But you are aware that Google did experiment with not
4 bidding on header bidding at all before doing Poirot,
5 correct?

6 A Not bidding on header bidding at all? It wouldn't be
7 bidding -- I'm sorry. I don't understand the question.

8 Q I can rephrase slightly.

9 You are aware that Google did experiment with not
10 bidding on exchanges that participated in header bidding,
11 not bidding on them at all before Google did Poirot,
12 correct?

13 A I don't remember that.

14 Q Okay. You stated on direct that not bid shading on AdX
15 made sense because AdX was a clean second-price auction; is
16 that right?

17 A That's not my testimony, no.

18 Q You are aware that through Project Poirot, DV360 did
19 not bid shade onto AdX until the introduction of the unified
20 first-price auction; is that right?

21 A That's correct, yeah.

22 Q Okay. So before September 2019, DV360 did not bid
23 shade onto AdX; is that correct?

24 A That's right. It passed the Poirot test.

25 Q And it is your view -- or you can tell me if it's

Cross-Examination - P. Milgrom

1 not -- that that made sense because AdX was a clean
2 second-price auction?

3 A It was my view that that's correct that it passed the
4 test and, therefore, wasn't bid on. I mean...

5 Q Maybe I'll just ask you: Do you have a view one way or
6 another whether AdX was a clean second-price auction at the
7 time?

8 A What does the word "clean" mean in that? You packed
9 something in there.

10 Q I will try to define it as best as I can recognizing
11 that I am asking questions of a Nobel Prize winner.

12 I will define a clean second-price auction as being an
13 auction where bidders do not have an incentive to bid shade.
14 Does that make sense?

15 A Okay. That's a very nonstandard definition, but okay.

16 Q Using that definition, is it your opinion that AdX was
17 or was not a second-price auction before the UFBA?

18 A So, again, that's not my definition. But using that
19 definition, there were times when bidders did have an
20 incentive to shade their bids somewhat.

21 Q Onto AdX?

22 A Onto AdX, yeah.

23 Q And is that because of RPO?

24 A Well, the context of this is confusing the words a lot.
25 It's been known for decades that in a second-price auction,

Cross-Examination - P. Milgrom

1 which is part of a larger process, the theorem that I
2 described doesn't include all the incentives. You could --
3 you might choose to shade your bid because you were worried
4 about revealing you had a high value for lots of reasons.
5 RPO was one of those reasons, yes.

6 Q So you are aware that Google Ad Manager ran RPO on AdX;
7 is that correct?

8 A Yes.

9 Q And it is your testimony, I think, that RPO meant that
10 AdX was not a clean second-price auction using my
11 definition. Is that correct?

12 MS. RHEE: Objection, Your Honor. I think that
13 mischaracterizes this exchange.

14 THE COURT: Well, you can address that on
15 redirect. All right. Overruled.

16 THE WITNESS: I think you've got a definition of
17 clean second-price auction that says that -- means that it
18 had an incentive to shade its bid because of RPO. Yes, RPO
19 did create a reason to shade bids.

20 BY MR. FREEMAN:

21 Q Okay. Let's turn to DTX 308, which the United States
22 would move to admit. It's at the very end of your binder.

23 A The end of the binder?

24 Q Yeah, the end of the document binder.

25 THE COURT: This is a defense exhibit. Is that

Cross-Examination - P. Milgrom

1 correct, Counsel?

2 MR. VERNON: Yes, it's a DTX.

3 THE COURT: I'm assuming there's no objection.

4 MS. RHEE: No objection, Your Honor.

5 THE COURT: It's in.

6 BY MR. VERNON:

7 Q Let's turn to page 9, which ends in 716. And I
8 apologize if this is too small to read. I will do my best.
9 Let's look at the last bullet point at the very bottom.

10 A I can see it.

11 Q This reads, "RPO must be carefully introduced to the
12 market since it has been live since 2015 and moves Google
13 away from a 2nd-price auction."

14 Do you see that?

15 A I do see that.

16 Q So at least in this document, this document describes
17 AdX as not being a fully clean second-price auction because
18 of RPO. Is that correct?

19 A Using your definitions of clean, yes, that is correct.

20 Q I think you also mentioned --

21 And you can set this document aside. Thank you.

22 When you were discussing Poirot in your testimony, you
23 mentioned the fact that, I think, only 1 percent of
24 advertisers opted out of Poirot. Is that right?

25 A Yes, sir.

Cross-Examination - P. Milgrom

1 Q Are you aware of exactly what Google disclosed to
2 advertisers when it gave them the chance to opt-out or not?

3 A I was aware that they had a chance to opt-out, yes.

4 Q But do you know the details of that disclosure?

5 A Of the disclosure, no, I don't.

6 Q Okay. Let's turn to UPR.

7 You offered the opinion on your direct that UPR was
8 intended or designed to reduce price fishing; is that right?

9 A Yes.

10 Q And you didn't in any of your report quantify how often
11 price fishing happened; is that right?

12 A Well, price fishing in the Unified First Price Auction
13 was not possible because of UPR. So it was done
14 preventatively.

15 Q Okay. But the question is you did not quantify that;
16 is that right?

17 A The question -- can you repeat the question, please?

18 Q You did not quantify how often price fishing happened;
19 is that right?

20 A There was no price fishing as far as I know because of
21 UPR.

22 Q Okay. I'll try a slightly different question.

23 You've heard of the phrase "self-competition"; is that
24 right?

25 A Yes.

Cross-Examination - P. Milgrom

1 Q That's a related concept that applies in a second-price
2 auction; is that fair?

3 A Yes.

4 Q You did not quantify how often self-competition
5 happened before the Unified First Price Auction, correct?

6 A I studied that there was a response. I didn't quantify
7 how often it happened. That's right. Correct.

8 Q You have not analyzed whether Google had other ways of
9 reducing price fishing other than UPR, correct?

10 A I did not.

11 Q You are aware that Project ELMO was a project based on
12 cookie throttling to reduce price fishing; is that right?

13 A To reduce the related multicalling problem, yes.

14 Q And you have not analyzed whether Google's Project ELMO
15 actually reduced price fishing; is that fair?

16 A We're switching back and forth between price fishing
17 and multicalling, which are very close I agree. So if you
18 could phrase your question using multicalling since price
19 fishing applied to the first-price auction, and I will have
20 a precise question to answer.

21 Q You have not analyzed whether Google's Project ELMO
22 reduced multicalling; is that correct?

23 A I didn't analyze that quantitatively, that's right.

24 Q And you have not analyzed whether Google could use a
25 query ID to reduce price fishing, correct?

Cross-Examination - P. Milgrom

1 A A query ID to reduce -- I understand people are still
2 struggling to create query IDs, but I didn't analyze that,
3 no.

4 Q And a query ID is an ID that could be applied to an
5 impression so that buyers would know when they are bidding
6 on a duplicate impression; is that right?

7 A That's what I understand it to mean.

8 Q And you did not analyze whether Google could have used
9 a query ID to reduce price fishing, correct?

10 A I didn't evaluate that at all in my report, right.

11 Q Your opinion was that having different floors for
12 different exchanges can lead to price fishing; is that
13 right?

14 A Yes.

15 Q UPR stops publishers from giving AdX a higher floor
16 than other exchanges; is that right?

17 A Right, and ensures -- yes.

18 Q But UPR does not stop a publisher from giving AdX a
19 lower floor than other exchanges, correct?

20 A It doesn't allow different -- UPR -- DFP doesn't allow
21 different floors for different exchanges except in the ways
22 we described.

23 Q But you are aware that other exchanges have their own
24 flooring tools; is that right?

25 A Other exchanges could have their own flooring tools and

Cross-Examination - P. Milgrom

1 did previously, yes.

2 Q And a publisher can use the flooring tools of another
3 exchange to give that other exchange a higher floor than AdX
4 even after UPR; is that correct?

5 A If the other exchange permitted that, that's correct.

6 Q And that can lead to price fishing; is that right?

7 A If the other exchange permitted, it could, yes.

8 Q UPR didn't stop that price fishing, correct?

9 A UPR would not prevent another exchange from
10 disadvantaging itself in that way, that's right.

11 Q And you have not analyzed whether UPR actually was
12 effective at reducing price fishing; is that correct?

13 A Well, there's no before and after. There's only -- I
14 couldn't do an empirical evaluation of that.

15 Q You have not analyzed whether UPR actually was
16 effective at reducing price fishing, correct?

17 A I think I've given my analysis using the evidence
18 that's available to me, that people were concerned about
19 price fishing, that the method of price fishing -- the most
20 common method of price fishing was blocked, and that the
21 alternatives to it were largely against the interests of the
22 exchanges that might have caused it.

23 Q When I asked you about this at your deposition, you
24 said you have not analyzed how effective UPR actually was at
25 reducing price fishing in practice, correct?

Cross-Examination - P. Milgrom

1 A I don't have -- what I meant then and what I mean now
2 is I don't have data about that.

3 Q Okay. So you have not analyzed whether it was actually
4 effective, correct?

5 A In the sense I have just said that precisely, yes.

6 Q In your direct, you talked about UPR imposing equal
7 floors; is that right?

8 A Yes, sir.

9 Q But I think, as we've just been discussing, UPR stops
10 publishers from giving AdX a higher floor but does not stop
11 publishers from giving AdX a lower floor compared to other
12 exchanges; is that correct?

13 MS. RHEE: This is asked and answered, Your Honor.

14 THE COURT: Sustained.

15 BY MR. FREEMAN:

16 Q Let's talk about the competitive effects of UPR. You
17 have heard of the term "most favored nations clause"; is
18 that right?

19 A I think you referred me to it in the deposition as I
20 recall.

21 Q If I use the phrase MFN to refer to the most favorite
22 nations clause, will you know what I'm talking about?

23 A Yes.

24 Q MFNs require that one particular company not get a
25 higher price than its competitors; is that right?

Cross-Examination - P. Milgrom

1 A Yes.

2 Q UPR also works like an MFN because it requires that no
3 exchange get a lower floor than AdX; is that correct?

4 A I see the analogy there.

5 Q When a firm with market power adopts an MFN, that could
6 reduce competition, correct?

7 A I haven't analyzed competition in this market, but in
8 the abstract, it could.

9 Q But when I asked you about this at your deposition, you
10 did agree that when a firm with market power adopts an MFN,
11 that can reduce competition, correct?

12 A Yes. And I have just agreed again, yes.

13 Q Okay. Let me ask you one related question. On your
14 direct, you refer to the possibility of publishers turning
15 AdX off as a way around UPR. Do you remember that?

16 A They can turn -- I don't -- pardon?

17 Q On your direct, you refer to the possibility that
18 publishers to get around UPR, meaning to steer to other
19 exchanges, could turn AdX off or choose not to turn it on,
20 correct?

21 A They could choose to turn it on or not. That's their
22 option.

23 Q But you didn't study how often publishers turned AdX
24 off, correct?

25 A No, I did not.

Cross-Examination - P. Milgrom

1 Q You didn't study AdX's market share; is that right?

2 A I did not.

3 Q If AdX has a high market share, that would suggest that
4 publishers do not frequently turn it off, correct?

5 A Well, the quantitative things speak for themselves,
6 yes. The higher its market share, the less possible that it
7 is that it's turned off frequently.

8 Q UPR eliminated a tool that publishers could use to
9 steer away from AdX; is that fair?

10 A A tool that publishers could use? Yeah. That they
11 could use, yes.

12 Q It is good for customers to be able to switch away
13 their suppliers if they want to, correct?

14 A It is, yes.

15 Q And that's because customer choice -- customer choice
16 encourages competition and innovation; is that correct?

17 A Yes, I think so.

18 Q On your direct, you talked about the different reasons
19 why publishers used floors before the Unified First Price
20 Auction and how those might change after the Unified First
21 Price Auction. Do you remember that?

22 A How they did change, yes.

23 Q You were aware that one reason publishers used higher
24 floors for AdX before UPR was to limit low quality ads; is
25 that right?

Cross-Examination - P. Milgrom

1 A I have heard that alleged.

2 Q And in that use case for higher floors for AdX would
3 not be affected by the change to a first-price auction,
4 correct?

5 A That use would not be affected.

6 Q You are also aware that publishers used higher floors
7 for AdX to reduce their dependence on AdX, again, before
8 UPR?

9 A I've heard that alleged.

10 Q And that use case for higher floors would not be
11 eliminated by the shift to a first-price auction, correct?

12 A The first-price auction wouldn't affect the set of
13 options that were available for that purpose, right.

14 Q You were also aware that another reason publishers used
15 higher floors for AdX was to help them fulfill volume
16 discount deals that they had with other exchanges; is that
17 right?

18 A I've heard that alleged. I'm very skeptical about it,
19 yeah.

20 Q Okay. But that's a use case for higher floors for AdX
21 that would not be affected by the shift to a first-price
22 auction, correct?

23 A If that were sensible, it would not be affected, yeah.

24 MR. VERNON: I pass the witness.

25 Thank you.

Redirect Examination - P. Milgrom

1 THE COURT: All right.

2 MS. RHEE: Thank you, Your Honor.

3 REDIRECT EXAMINATION

4 BY MS. RHEE:

5 Q I don't talk quite as quickly as Mr. Vernon. So let me
6 take each one of these in turn that Mr. Vernon did on your
7 cross-examination.

8 A Yes.

9 Q Now, you remember that the cross-examination began with
10 last look, and Mr. Vernon posed a series of hypotheticals to
11 you? Do you remember that?

12 A I remember more or less, yes.

13 Q Okay. And the first hypothetical was if a publisher
14 chose as the line item the same number as a header bid --
15 (Counsel confer.)

16 BY MS. RHEE:

17 Q So the first hypothetical was if a publisher chose to
18 insert the line item where the header bidding winning bid
19 was the same as that line item. Do you remember that's the
20 first qualifier?

21 A That's one of the qualifiers, yes.

22 Q And then the second qualifier was if the publisher then
23 also chose not to adjust the floor price for AdX. Do you
24 remember that second qualifier?

25 A Absolutely, I do.

Redirect Examination - P. Milgrom

1 Q Okay. And then the third qualifier was and if the AdX
2 auction only had one single bidder that cleared the floor
3 price set by the publisher --

4 MR. VERNON: Objection. It's the third question
5 leading in a row.

6 THE COURT: She's just clarifying what you had
7 asked. No. I'll overrule the objection.

8 BY MS. RHEE:

9 Q Do you remember that?

10 A Yes, I do.

11 Q Okay. I think we're up to three "ifs." Is that right?

12 A So far we are, yes.

13 Q Okay. And then the fourth "if" was an if there was a
14 turning on of DRS because otherwise that impression that the
15 publisher chose to put to the AdX auction would not
16 otherwise be filled?

17 A Right.

18 Q Okay. So we're up to four "ifs" now?

19 A Yes.

20 Q Okay. And then Mr. Vernon asked you if and only then
21 would there be an advantage for Google?

22 A Then there would be an advantage for Google, yes.

23 Q Okay. And then if you take all of those ifs away, what
24 is your opinion, Professor Milgrom?

25 A Last look does not create a necessary advantage for

Redirect Examination - P. Milgrom

1 Google because of the high floor price that the publisher
2 could set and was incentivized to set.

3 Q Now, with each of those ifs, whose choice and whose
4 control is it to put Google in an advantageous position and
5 rivals at a disadvantage?

6 A That would be the publisher's choice.

7 Q So is it the publishers or is it Google that is putting
8 the rivals at a disadvantage?

9 A It would be the publishers who are doing that.

10 Q Okay. Now, you remember Mr. Vernon then turned to
11 first look and what Mr. Vernon characterized as the first
12 look advantage?

13 A Yeah.

14 Q Okay. And he walked you through your example of the
15 clothing store. Do you remember that?

16 A Yes.

17 Q Okay. Now, the form of the question seemed to imply
18 that the high-quality inventory or the nicest clothes would
19 go to the first buyer. Do you remember that line of
20 questioning?

21 A I sure do, yes.

22 Q And I heard you very carefully qualifying each one of
23 your answers, but I want to make sure that the Court
24 understood your qualification.

25 A Yes.

Redirect Examination - P. Milgrom

1 Q So if you could, explain.

2 A Well, the nicest clothes might not fit me or the price
3 might be higher. But I'd look at the things that are best
4 for me that are -- it's a matching market. What's good for
5 me and what's best for me and what's best for you might be
6 different. And the one with first look is able to select
7 the ones that are best for the first buyer. And if they are
8 the same, then that results in a significant reduction in
9 inventory to later buyers. And if they're not, then it
10 doesn't. It's the first buyer's quality that matters.

11 Q So now, insofar as the questions posed to you in your
12 cross-examination suggested that the buyers later on in the
13 sequence would only get, quote/unquote, the scraps, do you
14 agree or disagree with that characterization?

15 A I disagree.

16 Q And can you explain to the Court why?

17 A Well, there's -- two reasons: One is the logical
18 reason, but I also did some empirical analysis. This is
19 something that hasn't come up but -- in the rest of the
20 testimony here, but about what's called adverse selection,
21 which is exactly this. That if quality means the same thing
22 to you and me and I get first choice, does that result in
23 you getting lower quality? I studied that empirically and
24 found no evidence that that was taking place.

25 Q Okay. Then I believe Mr. Vernon on cross-examination

Redirect Examination - P. Milgrom

1 moved on to Poirot.

2 A Right.

3 Q Now, he asked you to answer a series of hypothetical
4 questions based on a definition of a, quote/unquote, clean
5 second auction. Do you remember that?

6 A I sure do, yes.

7 Q And again, I was watching you closely, and you said --
8 well, that is not a standard definition. Can you explain to
9 the Court why Mr. Vernon's definition of a, quote/unquote,
10 clean second auction caused you to make the facial
11 expression that you made on the stand?

12 A I'm sorry for my facial expression.

13 Your Honor, when I presented the second-price auction
14 to you, I presented it without any other third parties,
15 without rev shares and take rates and so on. And I
16 presented it as a single auction, which is the standard --
17 it was the standard presentation, but it omits -- there's
18 much longer studies that say how you bid when you're bidding
19 in a sequence of auctions. You might have an incentive to
20 bid your full value in the first auction, but that might be
21 affected if you're worried about somebody learning your
22 value and using it against you subsequently. That's been
23 studied in economics for decades. A full analysis leads to
24 bid shading in a wider range of circumstances, even in a
25 second-price auction. So that was one of the things.

Redirect Examination - P. Milgrom

1 He wanted me to define a second-price auction as one in
2 which there's never an incentive for bid shading, and that's
3 just not what it means to be -- what it means to be a
4 second-price auction is that the high bidder wins and pays
5 the higher of floor price or the second highest bid. That's
6 the standard definition, and that's not what he wanted to
7 use.

8 Q And when you say a standard definition, standard to
9 whom?

10 A I've never heard anyone else use any other definition,
11 actually. It's certainly standard in the economics
12 literature.

13 Q Okay. So the definition that the government posed to
14 you in a hypothetical, is that the first time you have heard
15 a definition so defined in this way?

16 A It's the first time I have heard anyone say that
17 defines a second-price auction.

18 Q Okay. Now, you remember being asked on
19 cross-examination, again, in the context of Poirot, whether
20 or not you were aware of Google, quote/unquote,
21 experimenting with not bidding on exchanges that
22 participated in header bidding. Do you remember that
23 question?

24 A I remember that question.

25 Q And you did not recall any such experiment?

Redirect Examination - P. Milgrom

1 A I didn't recall one, no.

2 Q Okay. More importantly, in your review of the
3 documentation, are you aware of Google ever launching a
4 program or an act of conduct where Google stopped bidding on
5 exchanges that participated in header bidding?

6 A No, I'm not aware of that.

7 Q And then Mr. Vernon directed your attention to UPR. Do
8 you remember that?

9 A Yes.

10 Q Now, it got a little confusing in that discussion
11 because even though --

12 THE COURT: Counsel, we don't need the prefaces,
13 please.

14 BY MS. RHEE:

15 Q So do you remember being asked a series of questions
16 about query IDs in the context of multicalling rather than
17 price fishing?

18 A Yes, I do remember.

19 Q Okay. And you talked about query IDs or the problem of
20 query IDs, solving them is continuing to this day?

21 A Yeah. Well, I remember seeing documents at least from
22 2023 where people were trying to figure out how to do that.

23 Q And why is it --

24 MR. VERNON: Objection to foundation, Your Honor.

25 I think he testified on cross that he didn't analyze query

Redirect Examination - P. Milgrom

1 IDs as a way to reduce price fishing.

2 THE COURT: This answer doesn't say that he
3 analyzed them. He just said he was aware of problems in the
4 field. So overruled.

5 BY MS. RHEE:

6 Q And then insofar as you're aware of problems in the
7 field, why is it so hard and it's continuing to perplex
8 people today?

9 A Well, to create query IDs -- well, the publishers, the
10 one who has since called for bids and the -- if he's sending
11 multiple calls to know that there are calls for the same
12 impression has proved difficult. How do I know when you ask
13 me to bid twice that it's exactly the same impression that
14 you're asking me to bid for?

15 MR. VERNON: Objection, Your Honor. I just ask
16 counsel to identify where in his report that testimony comes
17 from.

18 MS. RHEE: This was in response to --

19 THE COURT: I've already heard it. So overruled.

20 BY MS. RHEE:

21 Q And then staying on the topic of UPR, counsel for the
22 government asked whether or not UPR prevented publishers
23 from lowering the floor for other exchanges. Do you
24 remember that?

25 A Yes.

Redirect Examination - P. Milgrom

1 Q Okay. Now, under the rollout of UPR, can publishers
2 lower AdX's floor in comparison to rival exchanges?

3 A They just set one set of pricing rules.

4 (Reporter clarification.)

5 A Yes, they only set one set of pricing rules that apply
6 to all, yes.

7 Q Okay. So they can neither preference AdX nor
8 disadvantage AdX or any other exchange?

9 A That's right.

10 MR. VERNON: Objection. Leading.

11 THE COURT: Sustained.

12 BY MS. RHEE:

13 Q Okay. Now, insofar as the government then asked you
14 about whether or not UPR can prevent other exchanges from
15 setting discriminatory floors, you answered, well, UPR
16 can't. Is that right?

17 A UPR doesn't control any other publishers -- any other
18 exchange, yeah.

19 Q Okay. And that's because those other exchanges are
20 separate companies that are free to do what they want?

21 A That's correct, yes.

22 Q Now, finally, you remember being asked by the
23 government attorney with respect to first look that -- I
24 think the question was, well, first look does not allow
25 multiple exchanges to bid against each other. That didn't

Redirect Examination - P. Milgrom

1 come about until header bidding; is that right?

2 A Something like that, yes.

3 Q Okay. And what's the span of time that we're talking
4 about from the introduction by DoubleClick of dynamic
5 allocation to the time we even get to header bidding?

6 A Well, let's see. DoubleClick introduces the first
7 version in 2007 and with live bids, which is what's
8 important for this, I think, was in 2009. And we start to
9 see header bidding adopted maybe five years later, 2014,
10 2015, something like that.

11 Q So we're just jumping around in time?

12 A Yes.

13 Q Okay. And then finally, before we get to the documents
14 that the government showed you, Professor Milgrom, to what
15 extent, if at all, as a matter of economics do you believe
16 that Google's changes to its own auction were improvements
17 at the time in which they occurred relative to what had come
18 before?

19 A Every one of the conducts we've described, Google's
20 programs benefited its own customers, either advertisers or
21 publishers or both.

22 Q Okay. So now flipping just quickly through some of the
23 documents in the government's binder, I want to direct your
24 attention to PTX 238.

25 A PTX what?

Redirect Examination - P. Milgrom

1 Q 238. I believe it's the very first tab.

2 A Thank you.

3 Q Okay. Now, if we can, go to the page ending in 609,
4 and if we could --

5 MR. VERNON: Objection. Scope. I don't think I
6 showed this document on cross.

7 MS. RHEE: Your Honor, it was in the government's
8 binder, and I think you'll see the point in its relevance
9 very shortly.

10 THE COURT: Where are you looking on 609?

11 MS. RHEE: And we can blow it up on the screen
12 here, Your Honor: It's probably unwise.

13 BY MS. RHEE:

14 Q You see here in this email chain involving a lot of
15 parties, one of the participant's writes, "It's probably
16 unwise for me to reply to this thread (next to Jonathan I
17 have basically zero experience in the business) so read this
18 with a grain of salt, an innocent idea proposed by an
19 engineer who knows very little about anything."

20 MR. VERNON: Your Honor, I renew the objection to
21 scope. I'm not sure how this addresses anything on cross.

22 THE COURT: Well, I can't recall. Did you move
23 238 in during your examination?

24 MR. VERNON: No, not during this examination.

25 THE COURT: It's a part of the case.

Redirect Examination - P. Milgrom

1 MS. RHEE: It's a PTX document, Your Honor.

2 THE COURT: Yes, I'm going to permit it in.

3 Go ahead.

4 BY MS. RHEE:

5 Q And this is -- the author of this is Martin Blais. Do
6 you see that?

7 A I do see that, yes.

8 Q And the government did introduce other documents during
9 your cross-examination using the same individual.

10 Dr. Milgrom, at any point in time when the government
11 showed you documents, did they identify who the speaker is?

12 A Oh, goodness. I'm not sure I can remember whether they
13 always did or not. Yeah.

14 Q Okay. All right. Then moving on to a document that
15 they did show you, let's go to PTX 542. And if we could, go
16 to the page ending in 337, which is something that the
17 government did not show you in this document --

18 MR. VERNON: Objection. We didn't show it because
19 it was redacted when it was produced.

20 THE COURT: Let's just move this along. Go ahead.
21 Ask the question.

22 BY MS. RHEE:

23 Q Okay. Here do you see that --

24 A There's nothing on my screen.

25 MS. RHEE: If we could show that, Your Honor, I

Redirect Examination - P. Milgrom

1 don't believe it's redacted. This is the page ending in
2 337.

3 Oh, I apologize. It is redacted. So let me move
4 on.

5 Thank you very much. Sorry about that.

6 BY MS. RHEE:

7 Q PTX 308, going back to a paragraph that the government
8 showed you and asked you questions about, PTX 308. And if
9 we could, go to the analyses section at the top, which is
10 where the government talked to you.

11 A Yeah.

12 Q Thank you so much.

13 Now, here the date of this document is 2016, or at
14 least this email correspondence is 2016. Do you see that?

15 A I see that, yes.

16 Q Okay. And to the extent that you go back to your
17 timeline, Professor Milgrom, by 2016, was header bidding
18 gaining a lot of traction and adoption?

19 A It was, yes.

20 Q Okay. And then insofar as the government basically
21 just told you this applied to first look rather than last
22 look, when you put it in the right time period, what are we
23 talking about?

24 A Okay. I'm not sure. What sentences am I looking at
25 here? I'm a little confused.

Redirect Examination - P. Milgrom

1 Q Here the government read to you the sentence that says,
2 "AdX looses matched impression share on pubs that implement
3 HB" -- header bidding --

4 A Yes.

5 Q -- "but tends to transact at higher CPMs."

6 Do you see that?

7 A Yes.

8 Q Okay. And here in this time period, because of header
9 bidding's adoption, has first look morphed into last look?

10 A So first look refers to first look over the waterfall.

11 Last look refers to last look over header bidding. I'm
12 sorry for the confusion. They have different applications.

13 When header bidding is dominant, first look loses its
14 important -- so many of the participants in the waterfall
15 and/or ones that haven't bid yet, and it becomes essentially
16 just last look.

17 Q Okay. Then here, in connection with last look, what is
18 the significance about the fact that AdX tends to transact
19 at higher CPMs?

20 A Well, that's the disadvantage. The disadvantage is
21 that the publisher is going to boost the -- is going to
22 boost the floor price and extract a greater revenue from
23 AdX.

24 Q And then similarly, the government showed you PTX 551.
25 And if we could, go to that email as well and particularly

Redirect Examination - P. Milgrom

1 focus on the date of that email at the top. It's all the
2 way down to the second paragraph that was shown by the
3 government.

4 A 8-27-17.

5 Q Again, by 2017, are we talking about first look or last
6 look?

7 A Last look would be the dominant there.

8 Q Okay. So, again, when you look at the sentence that
9 was called out by the government, "Our buyers enjoy a
10 competitive advantage from dynamic allocation" -- and here
11 the author, again, is not identified -- "because they
12 receive first look on inventory, which inherently provides
13 higher CPMs."

14 Again, just given the timing of this document, are we
15 really talking about first look or last look?

16 A No. It's confusing here because this explicitly refers
17 to first look in a period when last look had grown and
18 accounted for much of the transactions in the industry.

19 Q Okay. And then, again, when the sentence goes on to
20 talk about, "which inherently provides higher CPMs," is that
21 consistent with the testimony that you gave to the Court
22 about the disadvantage of last look?

23 A Yeah. And first look, whichever they're referring to.
24 The whole arrangement set higher CPMs for AdX.

25 Q Now, you were also shown by the government PTX 1650,

Redirect Examination - P. Milgrom

1 which is a Trade Desk document. And if we could, go to the
2 page ending in 055, which was not shown to you. And again,
3 the document here talks about Palooza 17. That's 2017?

4 A It sure looks that way, yes.

5 Q Okay. And by 2017, as reflected in this Trade Desk
6 document, you see here that not just Google but Amazon,
7 OpenX, PubMatic, and Rubicon are known to be developing more
8 efficient solutions for header bidding on the server side?

9 A Yes. That's referring to the client side
10 implementation, the first implementation having all the
11 problems that we discussed earlier.

12 Q Okay. And then similarly, what the government did not
13 show you in this deck ending in 058 -- again, this is a
14 Trade Desk document from 2017. The Trade Desk is
15 representing that its gaining market share?

16 A Yes.

17 Q And it's emerging as a stronger company?

18 A Yes.

19 MS. RHEE: Now, at this time, Your Honor, I think
20 we would seek to admit, without doing more, PTX 1674, which
21 is also in the government's binder, and it's a PTX document.

22 THE COURT: All right. Then it's in.

23 MS. RHEE: And then to move PTX 528, which we just
24 briefly discussed at the beginning of this.

25 THE COURT: All right. It's in as well.

Recross-Examination - P. Milgrom

1 MS. RHEE: No further questions.

2 Thank you very much, Professor Milgrom.

3 THE WITNESS: Thank you.

4 THE COURT: All right. Any recross?

5 RECROSS-EXAMINATION

6 BY MR. VERNON:

7 Q I'll be really brief. I don't want to go through all
8 of the documents. Let's just do one. Let's do PTX 308.

9 So again, the language that we looked at was under
10 "Rubicon strategy: Rubicon is pitching header bidding to
11 several of our partners because DRX has historically made it
12 difficult for SSPs to compete on a level playing field with
13 AdX."

14 Do you see that?

15 A I see that.

16 Q That sentence is talking about the difficulty that
17 dynamic allocation or first look created for exchanges
18 before header bidding, correct?

19 A It says historically. It's dated 2016. So it
20 presumably refers to some period before that, which includes
21 part -- a header bidding period and a pre-header bidding
22 period. I'm sorry. I don't see anything more than what is
23 here.

24 Q This is talking about Rubicon pitching header bidding
25 trying to popularize header bidding because without header

Direct Examination- P. Bjorke

1 bidding, first look would create a disadvantage for Rubicon,
2 correct?

3 A I see. You're interpreting because it's pitching
4 header bidding, so people who haven't used header bidding.
5 Yes, I see. So it must be referring to first look. I
6 infer.

7 MR. VERNON: Thank you. No further questions.

8 THE COURT: All right. Does anybody anticipate
9 calling this witness again?

10 MR. VERNON: Plaintiffs do not.

11 MS. RHEE: We reserve, Your Honor.

12 THE COURT: All right. Professor, then I want to
13 thank you for your testimony. At this point, you may have
14 to testify again. As an expert, you are allowed to be in
15 the courtroom.

16 MS. WOOD: Yes, Your Honor. I just have a
17 question about what they would be reserving. As I
18 understand it, they don't have a surrebuttal. So they're
19 intending to reserve him for later in their case?

20 THE COURT: Let it be. Because surrebuttal is
21 sometimes permitted by a court. So it's not absolutely
22 prohibited. But let's move on, please.

23 MS. DUNN: Your Honor, Google calls Per Bjorke.

24 THE COURT: All right.

25

Direct Examination- P. BJORKE

1 MS. MORGAN: Sorry, Your Honor. My second chair,
2 Annelise Corriveau, is just handing out the binders.

3 THE COURT: All right.

4 PER BJORKE, DEFENDANT'S WITNESS, SWORN

5 DIRECT EXAMINATION

6 BY MS. MORGAN:

7 Q Hello, Mr. BJORKE. Please introduce yourself and spell
8 your name for the court reporter.

9 A My name is Per BJORKE, P-E-R, B-J-O-R-K-E.

10 Q Where do you work?

11 A I work at Google.

12 Q And what's your current title?

13 A My title is director of product management.

14 Q How long have you worked for Google?

15 A Eleven years.

16 Q And what was your first position there?

17 A I was a product manager.

18 Q Do you work on a specific team at Google?

19 A Yes. I work on the team called air traffic quality
20 team, internally known as the AdSpam team.

21 Q Have you always been on the AdSpam team the whole time
22 you've been at Google?

23 A Yes, I have.

24 Q Aside from the work you've done at Google, do you have
25 other experience working on the integrity of online systems?

Direct Examination- P. Bjorke

1 A Yeah. In my time at Yahoo, I spent some of the time
2 there working on ensuring the integrity and accuracy of the
3 metrics that they use for measuring traffic, number of
4 visitors, and so forth to their web pages.

5 Q Was any of the work you did at Yahoo related to online
6 advertising?

7 A Yes. We did a lot of the back-end data processing and
8 a lot of analytics for the ad systems at Yahoo.

9 Q Do you have a background in computers and technology
10 besides the work that you've just described at Google and at
11 Yahoo?

12 A Yes. I have an undergraduate and a graduate degree in
13 computer science, and I spent my career working in software
14 and computer science fields.

15 Q Mr. Bjorke, your voice is a little low for me. If you
16 could speak up a little bit just to make sure everyone can
17 hear, that would be great.

18 A Will do.

19 Q And I didn't hear you say. Do you have academic
20 degrees in computer-related fields?

21 A Yes. I have a bachelor's degree and a master's degree
22 in computer science.

23 Q You said you work on the AdSpam team. Where does that
24 team sit within Google's business?

25 A The AdSpam team is part of an organization called the

Direct Examination- P. BJORKE

1 Ads Privacy And Safety, APAS, which is part of the Google
2 Ads organization.

3 Q Okay. I'd like to publish BJORKE Demonstration 1. You
4 have it in your binder, but you can also see it on the
5 screen there.

6 A Yeah.

7 Q What does this demonstration show?

8 A This diagram shows part of the Google organizational
9 chart, specifically, the knowledge and information division,
10 K&I, and the ads business. And then on the left, there's a
11 separate organization called trust and safety, which belongs
12 to a different part of the Google organization.

13 Q Okay. So let's take that a little bit at a time. What
14 is knowledge and information?

15 A That's the organization who handles search, Google
16 search, as well as Google -- the Google Ads products.

17 Q Okay. And then below that is the ads team, and there's
18 five squares below the ads team. What are those units?

19 A So the first one on the left is the ads privacy and
20 safety. That's where we belong. Then you have the search
21 ads, the YouTube ads, AvID, and BAM.

22 Q What does the ads privacy and safety team do?

23 A We handle all of the aspects related to privacy and
24 value, safety and integrity issues for the Ads business.

25 Q Okay. I think the Court has probably understood by

Direct Examination- P. BJORKE

1 this point what search ads and YouTube ads are.

2 Can you tell us what Avid is?

3 A Avid stands for apps, video, and display, and that's
4 basically all of the AdMob, AdSense, and AdX products.

5 Q And then what about BAM? What is that?

6 A BAM is buying analytics and measurements. Those are
7 the products that we provide to advertisers for running ad
8 campaigns, like Google Ads and DV360, as well as Google
9 analytics and other measurement products and technologies.

10 Q You pointed out trust and safety in the yellow on the
11 left side of the page. How does trust and safety fit into
12 this picture?

13 A So trust and safety is part of the legal organization,
14 and they have as many teams that support other teams across
15 Google. So we have a team in trust and safety that works as
16 an extension of Google AdSpam team.

17 Q Okay. Are there other teams within APAS or ads privacy
18 and safety besides your team?

19 A Yeah. Most of the Ads privacy and safety teams will
20 have a corresponding group inside of the trust and safety
21 team that works for them.

22 Q Okay. So let me now show Demonstration No. 2, which
23 will also show up on your screen.

24 What is this chart showing?

25 A This shows more details about the ads and privacy and

Direct Examination- P. Bjorke

1 safety organization, specifically, the five groups inside of
2 APAS.

3 Q Okay. Can you walk us just very briefly through what
4 each of those groups do?

5 A Yes. Privacy and regulatory deals with privacy and
6 regulatory compliance type of issues. Ad safety are dealing
7 with advertiser and publisher policy compliance to make
8 sure, for example, we don't show ads on sites that are not
9 meeting our policy criteria, like sites with illegal file
10 sharing, and that advertising campaigns are compliant with
11 our policies and regulations.

12 Then we have the AdSpam team. We deal with the
13 traffic, the traffic that goes between advertiser and
14 publisher.

15 Compliance deals with the various compliance type
16 related concerns and ads understanding deals with
17 classifying content related to advertising. For example, is
18 this content about cooking, is this content about sports,
19 and so forth.

20 Q How many employees do all of the APAS teams reflected
21 in this chart represent?

22 A All of APAS has over 700 employees.

23 Q Okay. Now I want to talk a little bit about your team
24 specifically, the AdSpam team. I know you said that you
25 deal with traffic. So tell us what the ads traffic quality

Direct Examination- P. Bjorke

1 team or the AdSpam team does?

2 A So we deal with making sure that the impressions and
3 the clicks that the advertisers are paying for are valid to
4 ensure that they get value for their spend. So, for
5 example, if a click is not from an actual user, then the
6 advertiser doesn't want to pay for it. And we make sure
7 that we detect that and don't charge the advertiser for it.

8 Q Are you familiar with the term "invalid traffic"?

9 A I am very familiar with that term.

10 Q Okay. What is invalid traffic?

11 A Invalid traffic are any ad clicks and impressions that
12 are not representative of a genuine user interaction or
13 intent. So, for example, if you have a software problem
14 sitting in the data center and you're visiting web pages and
15 clicking on links on a web page, that's not a user. An
16 advertiser would not want to pay for that.

17 Likewise, if you have a fat finger or accidentally
18 click on an ad on a mobile phone, that's also not valid
19 traffic because that's not the intentional user activity.
20 And as an advertiser, you probably don't want to pay for an
21 accidental click on a mobile device.

22 So those are all examples of invalid traffic.

23 Q Are you familiar with the term "ad fraud"?

24 A Yes, I am.

25 Q What is ad fraud?

Direct Examination- P. Bjorke

1 A So ad fraud isn't a well-defined term. It's typically
2 used in cases where people think about invalid traffic
3 generated for malicious purposes, typically, for making
4 money out of it for illegitimate reasons.

5 Q Okay. You described how invalid traffic impacts
6 advertisers. How does invalid traffic impact publishers, if
7 at all?

8 A So say an advertiser wants to spend a million dollars
9 with -- for running an ad campaign and they want to spend a
10 million dollars with, say, *New York Times*. If fraudsters
11 are able to siphon off \$100,000 of that spend, then that's a
12 \$100,000 that *New York Times* did not receive. So for every
13 dollar that goes to a bad actor, that's a dollar that good
14 publishers are not receiving.

15 Q How does your team actually combat invalid traffic day
16 to day?

17 A So we use every tool and approach you can imagine to do
18 this. So we mostly do it through automatic detection
19 through computers algorithms and machine learning and so
20 forth. We process a trillion-plus events every day. So
21 most of it has to be done through automation.

22 But we also have a large group of people, data
23 scientists and domain experts, that continuously analyze the
24 traffic and the patterns we see to try to identify new types
25 of attacks that the bad actors are developing.

Direct Examination- P. Bjorke

1 Because the bad actors are continuously evolving and
2 improving the way they try to defraud us in order to stay
3 ahead of us. It's an adversarial arm's race. So it's
4 through the manual analysis that we are able to understand
5 these type of attack factors and then update our automated
6 systems to catch them.

7 Q Do you have an understanding based on your experience
8 of why bad actors want to engage in ad fraud?

9 MR. FREEMAN: Objection, Your Honor. It calls for
10 the proposition -- and there has not been a proper
11 foundation.

12 MS. MORGAN: I am just asking based on his
13 experience.

14 THE COURT: I'm going to sustain the objection.

15 MS. MORGAN: Okay.

16 BY MS. MORGAN:

17 Q Do you know how much Google invested in the AdSpam team
18 in 2022?

19 A Yeah. Google invested in the ballpark of \$100 million
20 to \$150 million in running both paying salaries, as well as
21 all of the computers we run. To give you an idea, if you
22 compare it to a powerful desktop computer, we probably
23 consume 150,000 work of computers every day in just
24 processing all the data we do to try to keep the ecosystem
25 healthy.

Direct Examination- P. Bjorke

1 Q Is the AdSpam team a revenue-generating team for
2 Google?

3 A No, we are not a direct revenue-generating team. We
4 don't have a revenue target. Our job is to protect the
5 integrity of the Ads products and protect the long-term
6 sustainability of Google Ads' business. Through our work,
7 we have a healthier Ads business. So that helps the
8 business indirectly, but we do not have a direct revenue
9 goal for our team.

10 Q So you have talked a little bit about catching invalid
11 traffic. In addition to that, does Google do any more to
12 prevent bad actors from using its publisher tools?

13 A Yes. We do a lot of upfront work, so to speak, to
14 keep -- try to keep bad actors out of our ad networks.

15 MS. MORGAN: Okay. So if we could, put up
16 Demonstrative No. 3. Great.

17 BY MS. MORGAN:

18 Q Mr. Bjorke, what is this showing?

19 A This shows a diagram that shows the main processes we
20 use to try to keep bad actors out of our ad networks.

21 Q Okay. So tell us what happens in step one.

22 A So in step one, a publisher will sign up with our
23 network online, and they will provide name and email and
24 address and so forth as part of that sign-up process.

25 Q Okay. What about step two?

Direct Examination- P. Bjorke

1 A This is where we are running checks on the account
2 sign-up information. We look at the information they
3 provide. Does it look like a legitimate email address?
4 Does it look like a name and address we've seen before? We
5 even look at the technical indicators and signals we get
6 from the sign-up computer, like IP address and so forth, to
7 see if this is someone trying to sign up tens of thousands
8 of accounts from the same computer.

9 Q How many publishers are trying to sign up on a daily
10 basis?

11 A On a daily basis, we are running probably 15 to 20
12 thousand attempted account sign-ups.

13 Q Okay. So what happens then in step three after you've
14 gone through the account approval process?

15 A So at that point, the publisher would have to provide
16 the domain or the mobile app that they want to monetize, and
17 we will then check that that domain exists and that it has
18 some content and seems to be a legitimate publisher website.

19 Q Okay. And what about step four?

20 A Step four is a verification when they have started
21 making some money. So when you reach \$10 in earnings, we
22 will apply a bunch of additional verification steps. We may
23 try to verify their ID. We will actually send them a letter
24 in the mail to their address in order to provide a PIN code
25 that they have to give us into our system to verify their

Direct Examination- P. Bjorke

1 physical address. And we also check things like bank
2 account information and so forth that they provide to us.

3 Q When you say that you send the PIN verification to
4 their physical address, why do you do that instead of just
5 sending it on email?

6 A Ironically enough, since all of this is online --
7 online is really easy to fake a name and things like that.
8 It's easy to create lots of unique email addresses and so
9 forth. But if you want to create 10,000 accounts and you
10 have to have 10,000 unique postal addresses, that's
11 difficult.

12 Likewise, if you are sitting in Vietnam and you're
13 trying to pretend to be in the U.S. or in the U.K., it's
14 difficult to provide a physical address that you have access
15 to.

16 So it turns out that a physical address verification is
17 one of the most effective tools we have to try to ensure
18 that the -- prevent these bad actors from creating lots of
19 accounts or misrepresenting where they are.

20 Q Okay. Then there's a Box 5 that's in red here. What
21 happens in that step 5?

22 A So after a publisher has gone through all of this and
23 they reach the payment threshold -- so we pay them the first
24 time when they reach \$100. We will then continue to monitor
25 their activity and look for signs of bad activity, or maybe

Direct Examination- P. Bjorke

1 they are changing the addresses and things like that that
2 seems to be suspicious. And then we will figure additional
3 verification or reviews as needed based on that risk.

4 Q So you just walked us through the vetting process and
5 monitoring process for publishers. Is there a similar
6 process on the advertiser's side?

7 A So I only deal with the publisher's side as part of my
8 job typically. But we have a sister team, AdSafety, that
9 handles the same thing on the buy-side for advertisers, and
10 they have similar vetting processes to ensure that bad
11 actors don't penetrate our systems and come in as a fake
12 advertiser.

13 Q What are the benefits of Google's vetting process?

14 A The benefit is that instead of catching the invalid
15 traffic fraud later on, we can keep the bad actors out in
16 the first place. Then we don't need to battle and fight
17 them and catch them later on. So the more you keep them
18 out, the better luck you have on your front door. The
19 better you are protected basically.

20 Q And you talked a little bit about the ongoing
21 monitoring process. To what extent is that computer
22 automated?

23 A The vast majority is computer automated, but depending
24 on what we determine, it may be that we have some risk
25 indicators. And in that case, it will also go to manual

Direct Examination- P. Bjorke

1 reviews for further analysis and review.

2 Q Does Google own the computer automation systems that it
3 uses to do that monitoring?

4 A Yes, we own the systems ourselves.

5 Q Do you update the filters for those systems?

6 A Yeah. All of this is continuously updated. Some of
7 the systems are machine-learning base system. They will auto
8 tune themselves on a daily basis. Other systems we update
9 with various frequency from weekly to monthly.

10 Q Okay. You also mentioned manual portions of the review
11 process. What does that look like?

12 A So that's where we use the data scientists and the
13 domain experts to sit down and review the activity and try
14 to look for new types of attack and new types of abuse that
15 our automated systems haven't detected.

16 Again, it's an adversarial race, and the bad actors are
17 always trying to outsmart us. So we have to constantly stay
18 on top of them, look at what they're doing, and figure out
19 what's the new way of them abusing us.

20 Q What happens when your team actually detects invalid
21 traffic whether through automated screening or through
22 manual review?

23 A When we detect invalid traffic, we basically mark it
24 as invalid and basically zero it out. It's almost like it
25 didn't happen. So, for example, if an advertiser had a

Direct Examination- P. BJORKE

1 click that was costing a dollar and the publisher paid 90
2 cents, we would just mark it as nonexisting, and the
3 advertiser would not be charged or maybe refunded if they
4 had already charged them. And the publisher wouldn't be
5 paid.

6 Q Okay. When that happens, does Google still take a
7 revenue share?

8 A No, we don't because we basically zero out the
9 transaction. It's just like the transaction didn't happen.
10 So we don't make our profit on that. No one makes any
11 economic benefit from that transaction.

12 Q Why do you not charge a revenue share or a transaction
13 fee even though you go through the process of detecting
14 invalid traffic?

15 A We look at fighting fraud as an integral part of our
16 product. It's a key part of what you get when you advertise
17 with Google, and we don't charge extra for that.

18 Q Does your team ever work with third-party vendors to
19 detect invalid traffic?

20 A Yes. We have a partnership with one vendor, a company
21 called Human Securities, previously known as White Ops, that
22 we use to augment our in-house defenses. Because in this
23 space, no one is perfect. We believe that by using a
24 vendor, as well as our in-house defenses, we are even a
25 little better than we would be otherwise.

Direct Examination- P. BJORKE

1 Q Could Google outsource all of its work related to
2 detecting and containing invalid traffic to a third-party
3 vendor like Human Securities?

4 A No, it would not be effective.

5 Q Why not?

6 A Because an outside vendor will not have access to all
7 of the data we have. A lot of the data is, for business and
8 commercial and contractual reasons, confidential, and they
9 couldn't have access to all of that information.

10 Q Okay. Do you recall working on a team to develop a
11 product called AWBid?

12 A Yes, I do.

13 Q What is AWBid just very briefly?

14 A AWBid is a mechanism for AdWords' or Google Ads'
15 advertisers to be able to reach users that are coming in
16 through inventory through third-party exchanges. So these
17 may be publishers that are not working with any of the
18 Google Ads' networks.

19 Q When did Google start working on AWBid?

20 A Google had started working on AWBid before I joined in
21 2013. I believe it was around 2011 they started working on
22 it.

23 Q Before that, was Google Ads closed to third-party
24 exchanges to your knowledge?

25 A Yes.

Direct Examination- P. Bjorke

1 Q From your experience in AdSpam, was there a benefit to
2 Google Ads being closed to third-party exchanges?

3 A Yes, there was a very clear significant benefit of
4 being closed and only operating in a closed ecosystem.

5 Q What is the benefit?

6 A There were several. When we started going -- when we
7 had to support AWBid and basically buy from the open market,
8 it fundamentally changed how the foundation for how we
9 developed our spam defenses.

10 So, one, we didn't have a closed ecosystem anymore. We
11 didn't have a secure environment that we could control to
12 prevent tampering and misrepresentations through the
13 ecosystem to ensure the integrity of signal collection.

14 Two, we couldn't vet the publishers because they didn't
15 sign up with us anymore. So we couldn't keep bad actors out
16 of the network.

17 Three, the whole open ecosystem at that point were
18 based on prebid defenses, real-time ID detection before the
19 transaction happened. No one had the ability to collect
20 this financially after the fact, and that was completely
21 different than what we did.

22 And lastly, in the closed ecosystem for AdWords,
23 advertisers paid by click, and we paid the publishers by
24 click. In the AWBid world, we would still charge
25 advertisers on clicks, but we had to pay publishers on

Direct Examination- P. BJORKE

1 impressions. That further complicated the whole mechanism,
2 how we can ensure that bad actors couldn't profit from
3 committing ad fraud in that space.

4 Q What was the AdSpam team's role in AWBID?

5 A We consulted and advised the AWBID team on how to
6 develop the product in a way where we could continue to
7 protect our advertisers to the level they expected from
8 having used AdWords in the past.

9 Q When you first started working on AWBID, did your team
10 make any observations in terms of the level of invalid
11 traffic from third-party exchanges available through AWBID?

12 A Yes, we did. Some of the first experiments that they
13 ran on AWBID resulted in very, very high level of invalid
14 traffic, an exceptionally high level of invalid traffic.

15 Q Based on your experience and your analysis, why was
16 that?

17 A To a large degree, it's because those networks did not
18 invest much in trying to keep bad actors out of the
19 networks.

20 Q Earlier you mentioned challenges with signal collection
21 related to opening up Google's ecosystem. When Google had
22 started bidding on third-party exchanges through AWBID, to
23 what extent was signal collection a challenge for invalid
24 traffic detection?

25 A It was a big challenge because the bad actors will try

Direct Examination- P. Bjorke

1 to manipulate and falsify the information they use to
2 pretend to be valid traffic. In our closed ecosystem, we
3 have control of it. We can obfuscate it so they don't know
4 what they are collecting, and we can ensure the integrity of
5 that collection. It is very difficult for someone to
6 manipulate the signals we rely on when we're operating our
7 closed ecosystem.

8 When we operated in the open ecosystem, the information
9 we got when we got a bid request, it just came through a
10 text message, a text stream in the open AWBid protocol.
11 There was no integrity there. We had no way to know if
12 someone had tampered with that on the way to us.

13 And we couldn't necessarily deploy our normal signal
14 collection because it would be out in open. And then the
15 bad actors could immediately see what information we were
16 looking for and, therefore, know what they needed to fake.

17 So we had to invest a lot in trying to find an
18 alternative way to secure the integrity of our signaling
19 collection and obfuscate it such that the bad actors
20 couldn't falsify.

21 Q Why does signal collection matter just really simply?

22 A Signal collection is the foundation for all of our
23 detection. For us to detect if something is invalid, we
24 need to know things about the users, about the computer,
25 about the publisher, and so forth. If we don't have those

Direct Examination- P. Bjorke

1 signals, we don't know whether this is valid or not.

2 Imagine if your credit card company didn't know the
3 location, the time, the merchant, and so forth about your
4 credit card transaction. There's no way they could catch
5 credit card fraud. The same with us. If we don't know a
6 lot of details about these ad impressions and add clicks --

7 For example, where does a user click on an ad? If they
8 are always clicking on the same spot in the ad, well, that's
9 not human. Things like that are things we need to do in
10 order to detect the fraud.

11 Q Earlier you also talked a little bit about enforcement
12 of AdSpam policies. What challenges, if any, did AWBid
13 raise for your team in terms of enforcement?

14 A So I touched on the fact that in the open ecosystem
15 before that, every spam detection was done before you bought
16 the transaction. No one had the mechanism for correcting
17 for spam after the fact. So if we detected spam after the
18 fact, we were obligated to pay the publisher, and the
19 publishers were obligated -- so we were obligated to pay the
20 exchange, and the exchange would pay the publisher. We
21 couldn't claw back the money after the fact.

22 Just like in a credit card transaction. If a credit
23 card transaction is determined to be fraudulent after the
24 fact, the bank would claw back the money from the merchant.

25 That didn't exist in the open ecosystem before that.

Direct Examination- P. BJORKE

1 So we had to fundamentally renegotiate contracts with
2 exchanges and build out a lot of technology to handle that
3 because that did not exist.

4 Q I now want to show you Defense Trial Exhibit 277, which
5 has already been admitted in the case.

6 Do you recognize this document?

7 A Yes, I do.

8 Q Okay. What is it?

9 A This is an update about the AWBid project from 2015.

10 Q Okay. Since the Court has already seen this exhibit, I
11 just want to direct you to page 23 of the document, which is
12 titled Spam Issues.

13 Do you see that?

14 A Yes.

15 Q Okay. Great.

16 What is this slide showing?

17 A This is showing some of the challenges and some of the
18 efforts that have gone in to address those challenges
19 related to IVT and ad fraud, spam.

20 Q Okay. I want to talk about the bullets that are
21 underneath the heading protections in place and see if you
22 can help translate for everyone what these mean. The first
23 one says, "Auto-rampup spam-aware whitelist."

24 What protection is that referring to?

25 A I don't remember the details with that. I believe it

Direct Examination- P. Bjorke

1 had to do that we would check on the level of invalid
2 traffic for each exchange before we ramped up from, say,
3 1 percent to full integration with those exchanges.

4 Q Okay. And what about the -- the second bullet says,
5 "Botguard coverage via encrypted creative in type 1 and
6 available in type 2."

7 What is that referring to?

8 A Botguard is one of the technical mechanisms we have
9 collecting signals from the user's browser and the activity
10 that goes on that browser.

11 And encrypted means that we needed to try to protect
12 this signal collection so the bad guys couldn't reverse
13 engineer it.

14 Types 1 and 2 are two different types of integration
15 exchanges. So we had implemented the necessary steps to
16 encrypt the botguard signal collection for one of them but
17 not for the other one.

18 Q Okay. The next bullet says, "RTSF integration in XBFE,
19 same as DBM."

20 So I'm going to break that up because it's a lot of
21 letters. What is RTSF integration referring to?

22 A RTSF stands for real-time spam filtration. That's the
23 mechanism we have for detecting invalid traffic in
24 real-time.

25 Q Okay. So what is this describing?

Direct Examination- P. Bjorke

1 A This basically described that we had to integrate our
2 real-time spam detection into the pipelines, the computer
3 pipelines that the AWBid team built for hooking up Google
4 Ads or AdWords to buy from the third-party exchanges.

5 Q Okay. At the end, it says, "same as DBM." What is DBM
6 in reference to?

7 A DBM was the previous name of DV360.

8 Q The last bullet here is referring to a refund clause.
9 Do you see that?

10 A Yes.

11 Q So what is that referring to?

12 A That's referring to what I mentioned about the
13 contractual terms, to be able to claw back for invalid
14 traffic that had been detected after the fact.

15 So at this point in time, we had negotiated refund
16 rights, a process in the contracts with the exchanges, but
17 the process, the automation to be able to handle it had not
18 been implemented yet. That was still work that was
19 remaining to be done.

20 MS. MORGAN: Okay. We can go ahead and take this
21 down.

22 BY MS. MORGAN:

23 Q At the time Google was working to put these protections
24 in place, did Google already have a buying tool that bought
25 out third-party exchanges?

Direct Examination- P. BJORKE

1 A Yes. DV360, DBM at the time, was buying from
2 third-party exchanges at that point.

3 Q So if Google had DV360 buying on third-party exchanges
4 already, why couldn't it just do the same thing in Google
5 Ads that it did in DV360?

6 A Because the technology and the pipes and systems that
7 DV360 was running on was different than what AdWords or
8 Google Ads were running on.

9 Q Okay. And how was it different?

10 A It was just different systems, different software that
11 were running. It didn't have a unified consolidated stack.

12 Q Okay. I'm now going to show you a document that's been
13 marked PTX 791, which has already been admitted.

14 Do you recognize this document?

15 A Yes, I do.

16 Q What is it?

17 A This is an update about AWBid from November 2019.

18 Q Okay. So again, the Court has already seen this. So
19 I'm just going to go to one slide which is marked with the
20 last Bates digits 224. And I just want to point you to the
21 second bullet here which says, "Spam: It's a wild world out
22 there."

23 What is this referring to?

24 A This was a rather casual description of what the
25 challenges we were facing with regard to invalid traffic in

Direct Examination- P. Bjorke

1 the open ecosystem in third-party exchanges. It was pretty
2 crazy.

3 Q So at this point in 2019, was your team continuing to
4 work to contain invalid traffic from third-party exchanges
5 on AWBid?

6 A Yes, it was an ongoing effort.

7 Q Are you still doing that work today?

8 A Yes, we do.

9 MS. MORGAN: Okay. We can go ahead and take that
10 down.

11 BY MS. MORGAN:

12 Q I want to turn to another topic. Are you familiar with
13 the fraud scheme known as Eve?

14 A Yes, I am very familiar with the Eve scheme.

15 Q Why are you very familiar with it?

16 A We spend a lot of time on it in over five years before
17 it finally got closed out. It was a very large fraud
18 operation that had been battled for years.

19 Q Okay. When did that happen?

20 A It started in 2017.

21 Q And what was Eve -- how was Eve operating?

22 A Eve was a set of fraud operations by a group of people.
23 They had three or four different types of operations. The
24 primary one was leveraging was called a botnet. They had a
25 large number of home computers infected with malware that

Direct Examination- P. Bjorke

1 they used to execute their fraud scheme. Those computers
2 were set up to go and visit lots of fake web pages that
3 pretended to be legitimate publishers. And then the
4 fraudsters were able to get paid for all of those fake ad
5 impressions.

6 Q What was Google's involvement in Eve?

7 A We were the -- one of two primary companies that
8 detected and understood an Eve operation. And in the end,
9 we referred it to law enforcement, which successfully
10 apprehended several of the people behind it and prosecuted
11 them. And it followed up with the takedown of the whole
12 operation after a year and a half.

13 Q Where did you see the fraud from Eve happening in
14 Google systems?

15 A The vast, vast majority of the Eve traffic we received
16 and bought came from the third-party ecosystem. It was a
17 very small portion that had infiltrated.

18 Q Why is that?

19 A I believe that is primarily because we made it very
20 hard for bad actors to infiltrate our AdSense and AdX
21 networks. While in the opaque ecosystem, supply chain in
22 the third-party exchange ecosystem, it was very easy to
23 blend in and infiltrate that ecosystem.

24 Q Okay. I would like to now show Defense Trial
25 Exhibit 635.

Direct Examination- P. BJORKE

1 THE COURT: Any objection to 635?

2 MR. FREEMAN: Yes, Your Honor. We object on
3 hearsay and relevancy grounds. I mean, this is basic
4 character like evidence for Google about their referral to
5 the FBI.

6 THE COURT: I'm going to overrule the objection.
7 I think it does assist the defense in this case.

8 Go ahead.

9 BY MS. MORGAN:

10 Q Okay. Mr. BJORKE, I'm showing you what's been marked
11 as Defense Trial Exhibit 635. Do you recognize this?

12 A Yes, I recognize this.

13 Q What is it?

14 A This is a blog we published in late 2018 about our work
15 on the Eve case. This was after the Department of Justice
16 and the FBI had announced their efforts in this case and the
17 takedown they had.

18 Q Okay. I want to direct your attention to page 3 of the
19 document to the operation summary chart.

20 Do you see that?

21 A Yes.

22 Q Okay. So I want to walk you through what some of these
23 numbers mean. On the left side, it says, "3b+ daily bid
24 requests." What is that referring to?

25 A So bid request is how many ad slots or ad impressions

Direct Examination- P. Bjorke

1 that they make available for you to potentially buy.

2 And in this case, these people -- this fraud operation
3 produced more than 3 billion bid requests. These are
4 attempts to sell you an ad slot, 3 billion of those per day.
5 It was quite a lot higher at the peak. This is how much
6 traffic they created. It was a very, very large operation.

7 Q And next to that, there's a figure that says, "1m
8 Compromised IPs." What does that figure represent?

9 A That represents how broadly they had distributed the
10 traffic to make it look like it was normal. It looked like
11 it was 1 million people who were browsing the web, and they
12 did that to make it look like it was normal users visiting
13 it.

14 In fact, most of those one million were actually
15 compromised home computers that they had infected with
16 malware. Then they, through the control and command
17 servers, directed those home computers to visit these web
18 pages in the background. So you had about a million people
19 who had -- or 700 to a million people who had these
20 infections on their home computers.

21 Q And below that, it says "10k+ websites counterfeited."
22 What is that referring to?

23 A The way these people got away with so much traffic was
24 to pretend to be well-known websites. They pretended to be
25 the *New York Times* and the *Washington Post* and so forth. So

Direct Examination- P. Bjorke

1 when advertisers saw their placement reports, they would
2 see, oh, lots of ads on *New York Times*, NBC, CBC, and so
3 forth. So they didn't react.

4 And they did that by basically faking or counterfeiting
5 over ten thousand different websites. So they created fake
6 copies of that. And all of the trafficking and reporting
7 and verification happened by the ad tech companies -- they
8 successfully made it look like it was those legitimate
9 websites, but it wasn't.

10 Q Do you have an estimate of financial impact to Google's
11 publisher and advertiser customers from the Eve scheme?

12 A Our advertisers did not lose money because we refunded
13 them for all of the Eve traffic that we detected.

14 Publishers lost money because these bad actors got paid
15 \$30 million to \$40 million -- \$20 million to \$30 million for
16 this operation.

17 Google lost between \$30 million and \$40 million on this
18 operation.

19 And then there were losses in other parts of the ad
20 tech industry that we don't know how big they were, but it
21 was likely significantly bigger than ours.

22 Q That might answer my next question, which is did Eve
23 only impact Google?

24 A No. Eve impacted the whole industry. We bought
25 this -- as you see on this slide, this fake inventory was

Direct Examination- P. Bjorke

1 sold through 60,000 -- over 60,000 different sellers in the
2 ecosystem. It was everywhere. So there's no reason to
3 believe we were the only ones who bought it because it was
4 everywhere.

5 Q Once your team detected the Eve scheme, were you able
6 to contain the problem?

7 A We did, but it was an ongoing battle. Because as soon
8 as we detected it, the bad actors updated their fraud
9 operation to try to hide. So it was a cat-and-mouse game
10 for several quarters. We had to develop new solutions. We
11 had to specifically go and probe for certain functions in
12 their versions of the Chrome browser they used and so forth
13 in order to detect them. It was an ongoing battle for many
14 months to contain it.

15 Q Were there other schemes related to Eve that you also
16 detected?

17 A Yes. And there was a well-known case a few months ago
18 that was called Massbot (phonetic) that Human Securities
19 wiped out at the time, had published about it. It was a
20 very similar operation.

21 Q What was the overlap between the two schemes?

22 A They had a lot of similarities, and there's several
23 reasons to believe they collaborated -- the bad actors
24 collaborated to some degree on those two schemes.

25 Q So you talked a little bit earlier about the fraudulent

Direct Examination- P. BJORKE

1 websites that were generated through the Eve scheme. Were
2 impressions on fraudulent websites being sold through
3 Google's tools?

4 A A minimum. There was very little impact through our
5 AdX network.

6 Q If there was very little, how were you able to detect
7 the scheme?

8 A So DV3 bought this from third-party exchanges, and
9 through our antifraud effort on DV3, on DBM at the time, we
10 detected this.

11 We also collaborated actively with White Ops, and we
12 collaborated with other security companies, antivirus
13 companies, and so forth to understand this operation. We
14 had helped to diverse engineer and find the malware. It was
15 a very intense industry collaboration to fully understand
16 this operation and try to minimize the harm from it.

17 Q What, if anything, did you learn about the benefits of
18 end-to-end integration from the Eve and Methbot schemes?

19 A The end-to-end integration allows you to have better
20 signal collection. You can protect your signal collection
21 from manipulation and adverse engineering, and you can much
22 more effectively keep bad actors out.

23 In the end, there was only two shell companies behind
24 all of this traffic, but most of the companies, the
25 intermediaries in the ecosystem, had not done a decent

Direct Examination- P. Bjorke

1 vetting process. We had no transparency interest. So we
2 didn't know that it all came from two companies. If it had
3 been in our ecosystem, they couldn't have done that because
4 we have that visibility into all of publishers.

5 Q All right. I want to take this down, and the next
6 exhibit I want to go to is Defense Trial Exhibit 476.

7 THE COURT: Any objection to 476?

8 MR. FREEMAN: No objection.

9 THE COURT: All right. It's in.

10 BY MS. MORGAN:

11 Q Mr. Bjorke, do you recognize this document?

12 A Yes, I do.

13 Q What is it?

14 A This was a proposal for a long-term strategy that we
15 developed in 2017 during the height of battling Eve for how
16 we could better fight ad fraud in the future.

17 Q Why did you put this presentation together?

18 A Because in 2017, this was really an existential
19 question for the online advertising industry. We had very
20 large companies trying to stop online advertising. We had
21 the CMO of a large Japanese auto manufacturer fly to
22 Mountain View to talk to us about ad fraud. This was
23 existential for Google's business and for the rest of the
24 online advertising business.

25 And we needed -- when we saw how much money these guys

Direct Examination- P. Bjorke

1 made, the Eve guys made from this fraud operation, they
2 could hire a ton of people and develop more advanced fraud
3 operations. We needed to cut off funding, and we needed to
4 improve marketers' confidence in online advertising.
5 Otherwise, the online advertising wouldn't prosper going
6 forward. We were not winning the battle at that point.

7 Q I want to direct your attention to page 5 of this
8 document, which says, "Two fundamental options, with many
9 sub considerations."

10 Are you familiar with this slide?

11 A Yeah, I'm very familiar with this.

12 Q Okay. Can you summarize what you saw at this point as
13 the two basic options for strategy moving forward?

14 A The two options were either we would focus internally
15 in Google to protect Google's advertisers and Google's ad
16 products from invalid traffic and ad fraud, or we would try
17 to focus on helping clean up the whole industry, the whole
18 ecosystem from ad fraud.

19 Q Okay. So staying on this same page and laying out the
20 two options, you summarize each by writing in parentheses,
21 "grow slice," option A, or "grow pie," option B.

22 Why did you label the two options this way?

23 A Because if we were to just focus on Google, it wouldn't
24 help create trust in the whole online advertising ecosystem.
25 It would just hopefully create trust in Google's ability to

Direct Examination- P. Bjorke

1 fight fraud, and maybe more advertisers would use Google.

2 But that wouldn't help very much because at that point,
3 online advertising wasn't that large. And the growth in
4 online advertising would come from convincing marketers to
5 move budgets from TV and traditional media online. And if
6 you had the regular drum beat of bad news in the press about
7 fraud everywhere in online advertising, the CMOs would
8 likely not feel comfortable moving TV budgets online. So we
9 proposed instead to try and help clean up the whole
10 ecosystem and help grow a market, grow a pie instead of a
11 slice.

12 Lastly, also, we needed to cut off funding for the bad
13 guys because the bad guys don't care where they get paid
14 from. If they get paid from us or someone else, it doesn't
15 matter. If they make a \$100 million, they can hire an awful
16 lot of people. If they are sitting in Eastern Europe or
17 wherever they are, they can hire a lot people. And they are
18 smart, and they can get much, much more sophisticated. That
19 would be very hard for us to defend. We had to cut off
20 funding for the bad guys.

21 Q So which of these two options, option A or option B,
22 would be more work for Google?

23 A Option B would be clearly more work for Google.

24 Q And which option did your team recommend?

25 A We strongly recommended option B.

Direct Examination- P. BJORKE

1 Q How, if at all, does option B relate to protecting
2 Google advertisers who buy on third-party exchanges?

3 A It's essential for us to protect Google advertisers who
4 buy from third-party exchanges. Because if we couldn't help
5 clean up the whole ecosystem, there would be so much fraud
6 in that third-party ecosystem. Even if we were able to keep
7 our closed ecosystem reasonably clean, we would be exposed
8 when they bought from third-party exchanges.

9 Q So which of these two options did Google ultimately
10 choose?

11 A We went with option B. Not all of the items in here,
12 but we went with option B.

13 Q How, if at all, did that change the nature of your work
14 on the AdSpam team?

15 A So specifically, it changed my -- our team's mission
16 from only focusing on Google to also helping clean up the
17 whole industry. And specifically, it meant I spent a lot of
18 my time working on industry work, collaboration, industry
19 standards development, and other efforts to try to help
20 clean up the whole industry instead of just Google.

21 Lastly, it meant that we were much more willing to
22 share our understanding and our expertise with others
23 because we knew it would benefit everyone else. It wasn't
24 going to be used as a competitive advantage.

25 Q You were just talking about standards. Are you

Direct Examination- P. Bjorke

1 familiar with something called ads.txt?

2 A Yes, I am.

3 Q Okay. And how are you familiar with ads.txt?

4 A I was integral -- I was part of the core team who
5 developed the idea and executed and drove the adoption of
6 ads.txt across the industry.

7 Q Okay. Very briefly, what is ads.txt?

8 A Ads.txt is a way for publishers to share with the world
9 who is allowed -- who is authorized to sell your inventory.
10 Imagine that Rolex will publish a list of authorized Rolex
11 dealers. That way you know if you go to a jeweler downtown,
12 you can see if they are authorized. While if you see a guy
13 on the street trying to sell you a Rolex, you can check that
14 they are not authorized. There's a way of decentralizing
15 the effort of creating awareness of who can sell whose
16 inventory.

17 So *New York Times* can tell who is authored to sell *New*
18 *York Times* inventory. *Washington Post* can tell us who is
19 authorized to sell *Washington Post* and so on.

20 Q Why was there a need for a standard like ads.txt?

21 A Because when you look at the Methbot and Eve cases,
22 they did domain misrepresentation. That was the most common
23 approach for bad actors to commit in ad fraud operations up
24 until then. It was a multibillion dollar business at that
25 point. And we needed a way to stop that. We needed an

Direct Examination- P. Bjorke

1 effective way to stop that instead of just chasing the
2 signals and so forth. We needed to follow the money.

3 Because one thing is standard for all cyber crime is
4 you follow the money as an effective way to do it. And by
5 allowing publishers to tell everyone who is authorized to
6 sell it and ensure the money goes to them, we would
7 effectively stop that type of ad fraud attack.

8 Q So how do you actually access ads.txt to see who the
9 authorized sellers are for a publisher?

10 A You simply go to a website's URL -- so say
11 washingtonpost.com -- and then you add slash ads.txt, or you
12 go to newyorktimes/ads.txt and so forth. And then one can
13 go and look at any publisher that ads.txt list publicly on
14 the Internet.

15 Q Okay. Let's take a look at how that works. I am going
16 to put up Demonstrative No. 4.

17 What is this demonstrative?

18 A This is page 4 of a publisher named News Leader.

19 Q Okay. And if you wanted to go to the ads.txt page, how
20 would you do that?

21 A You just add a slash and A-D-S.txt at the end of the
22 URL.

23 Q Okay. And now let's look at Demonstrative No. 5. What
24 is this showing?

25 A This shows the ads.txt slide for newsleader.com.

Direct Examination- P. Bjorke

1 Q This is a very long list. So we have a scroll on it.

2 I'll just let you go all the way down.

3 A Yeah.

4 Q What do each of these names represent?

5 A Each of these names represent an ad tech company that
6 newsleader.com has authorized to sell their inventory.

7 Q Okay. And so what are some of the companies that the
8 Staunton News Leader has put on here?

9 A You see everyone almost here. You see Rubicon, Yahoo,
10 Facebook, Google, AppNexus, Rubicon, PubMatic, AOL. Pretty
11 much every company you can imagine in the industry are
12 listed here it looks like.

13 Q Okay. What role did you have in making ads.txt an
14 industry standard?

15 A So after we developed the proposal, we shared it with
16 the IAB Tech Lab, which is an industry body, and it adopted
17 the standard.

18 And as soon as the standard was published, I was very
19 active in trying to educate the industry about it, raise
20 awareness for the need for it. Of course, we had the
21 firsthand experience from the fraud cases.

22 We had some publishers who did a test. They turned off
23 their ad servers, and we could see how much traffic was
24 still coming pretending to be from these publishers.

25 *Financial Times* did an interesting study where they

Direct Examination- P. BJORKE

1 found that there's only two authorized sellers of *Financial*
2 *Times* of video inventory, but there was like 50 of them in
3 the marketplace. So there's obviously a lot of bad stuff
4 going on.

5 So I was very active in education, awareness, and then
6 I lobbied internally for us to start using our products in
7 order to kind of kick off that process of adoption and
8 enforcement using it.

9 Q Okay. What effect has the widespread adoption of
10 ads.txt had on ad fraud issues?

11 A This little simple text file has basically closed the
12 door on this type of fraud. Domain misrepresentation as in
13 fraud vector no longer exist in this space. It's basically
14 eliminated a \$50 billion abuse fraud opportunity.

15 Q Okay. With widespread adoption of ads.txt, could Eve
16 or Methbot operate today?

17 A They could not. They could not operate the way they
18 operated today. This thing has closed that opportunity.
19 It's been very successful.

20 Q Why did you not keep ads.txt only for Google's use?

21 A One, our objective, our mission was to help clean up
22 the industry. Two, it wouldn't be very effective if we kept
23 it in-house because we needed all publishers everywhere in
24 the world to adopt, and we wanted every company to adopt it.
25 Because then when we buy traffic from the third-party

Cross-Examination - P. Bjorke

1 exchanges, there's less fraud there.

2 As well as, it helps reduce funding for the bad guys,
3 and it helps increase trust in online advertising. So it's
4 a win-win for everyone when you get the whole industry to do
5 it. We could simply not do it by ourselves and get that
6 benefit.

7 Q What parts of Google's ecosystem benefit the most from
8 the adoption of this standard?

9 A It's the DV3 and AWBid buyer from third-party exchanges
10 that benefits the most directly.

11 Q Have you to date been able to achieve parity in terms
12 off traffic threats on Google's end-to-end to integrated
13 system versus buying on third-party exchanges?

14 A No, we haven't. And we have made great progress, but
15 there's inherent difficulties that you cannot solve and that
16 will mean that it's never quite at parity.

17 MS. MORGAN: Okay. I pass the witness.

18 THE COURT: All right.

19 CROSS-EXAMINATION

20 MR. FREEMAN: May I proceed, Your Honor?

21 THE COURT: Yes, sir.

22 CROSS-EXAMINATION

23 BY MR. FREEMAN:

24 Q Good afternoon. My name is Michael Freeman. I work
25 with the Department of Justice. I have some questions for

Cross-Examination - P. BJORKE

1 you. Okay.

2 So I just want to be clear about kind of the scope of
3 your testimony that you gave on direct. Since you've been
4 working at Google, you've been exclusively working in AdSpam
5 and ad traffic quality; is that fair?

6 A That's correct.

7 Q And you've been there since -- I think you said 2013.

8 A Yes.

9 Q Okay. So your role at Google had nothing to do with
10 the DoubleClick or Admeld acquisitions?

11 A Correct.

12 Q You're not in charge of determining kind of the auction
13 logic of the sale of digital display advertising?

14 A Correct.

15 Q Meaning you're not in charge or you don't weigh in on
16 whether it should be a first- or second-price auction?

17 A Correct.

18 Q You're not involved in whether Google should bid shade
19 into the auction?

20 A Correct.

21 Q Whether publishers could set floors or not set floors?

22 A Correct.

23 Q Okay. So I do want to talk to you about the area that
24 you work on in terms of inventory, about it. It's fair to
25 say, though, that no one who operates in this space is

Cross-Examination - P. Bjorke

1 perfect in this regard, right?

2 A No one is perfect in the ad fraud space.

3 Q And the concerns that you addressed on direct are
4 concerns industry-wide, meaning they apply to Google as much
5 as any other companies that we've talked about here, OpenX,
6 Rubicon, Index Exchange? It's an industry-wide problem,
7 right?

8 A The basic problem of invalid traffic in ad fraud
9 applies everywhere. The nature of it varies depending on
10 business models and so forth.

11 Q Because it's an industry-wide problem, Google then
12 collaborates with other industry participants in various
13 groups or consortiums, right?

14 A In the ad fraud space -- fighting ad fraud space, yes,
15 we collaborate with other companies.

16 Q And one of those groups or consortiums that Google
17 collaborates with other people is a group called IAB or
18 sometimes even an offshoot of that being IAB Tech Labs,
19 right?

20 A Yes. The IAB Tech Lab is an organization we
21 collaborate with.

22 Q And it's not just Google who is a part of IAB Tech
23 Labs, right?

24 A Correct. Many companies are participating in the IAB
25 Tech.

Cross-Examination - P. BJORKE

1 Q And you talked about on direct examination the -- how I
2 think you finished was the ads.txt, the A-D-S-T-X-T, right?
3 Do you remember that testimony?

4 A Yes.

5 Q All right. That innovation, that actually came out of
6 the IAB Tech Labs, right?

7 A That's correct.

8 Q Okay. So it was not Google proprietary technology that
9 was --

10 A The authorized seller standard is not a Google
11 proprietary standard.

12 Q And many different industry participants contributed to
13 the ads.txt beyond just Google, right?

14 A If you're referring to the development of the standard,
15 the standard was developed by Google, and it was reviewed
16 and ratified by the industry group. A lot of companies
17 contributed to driving adoption of the standard.

18 Q Well, the author of the ads.txt -- version 1 I'm
19 talking about, the very first version, that came out in
20 2017. The first author listed was Neal Richter, right, who
21 worked for not Google, right?

22 A Neal --

23 Q It is a yes or no.

24 A He was -- he worked for Google at the time as a
25 consultant.

Cross-Examination - P. BJORKE

1 Q Right, as a consultant. He was not a Google employee?

2 A Correct.

3 Q All right. And there are other significant

4 contributors to that report, including people from the Index

5 Exchange, right?

6 A They were contributors to the standard in the review

7 process. They did not contribute to the development on the

8 proposal for a standard.

9 Q And there were other significant contributors from

10 Criteo?

11 A Yes, again, for the review and finalization of the

12 standard, correct.

13 Q Other major contributors were AppNexus?

14 A Yes.

15 Q The Trade Desk?

16 A Probably. I don't have it in front of me. So I don't

17 remember exactly who were involved. Again, the standard was

18 developed by Google.

19 Q The actual announcement of ads.txt did not come from

20 Google, right?

21 A Correct.

22 Q Okay. And in the report announcing it, it listed all

23 of those other industry participants of significant

24 contributions, right?

25 A That's likely correct. I don't have the announcement

Cross-Examination - P. BJORKE

1 in front of me.

2 THE COURT: Well, after a review process, was
3 there feedback and were changes made then to the basic
4 program?

5 THE WITNESS: There were some minor -- there were
6 feedback and review, and there were some minor modification.
7 I don't remember exact details, but the whole concept came
8 from the proposal that we developed in-house at Google. We
9 developed it, and we shared it with the industry body to
10 increase the chances of it being adopted as an industry
11 standard and help fight fraud.

12 BY MR. FREEMAN:

13 Q So other industry participants, then, made modification
14 before it was initially announced?

15 A As far as I remember, there were minimal modifications,
16 maybe some small additions to it, but the concept didn't
17 change.

18 Q Another group that you work with or consortium that
19 Google works with beyond IAB is called TAG or The
20 Trustworthy Accountability Group? Are you familiar with
21 that group?

22 A Yes, I'm familiar with them.

23 Q And the purpose of that group is similar to these other
24 consortiums, meaning that they exist to eliminate and fight
25 ad fraud and malware and invalid traffic, right?

Cross-Examination - P. Bjorke

1 A That's part of their charter, yes.

2 Q And Google participates in this group TAG?

3 A We have participated in the past, yes, and we are still
4 a member.

5 Q And other members are still the companies that we had
6 previously talked about, meaning like the Criteo, The Trade
7 Desk -- I don't need to go on, but there are other industry
8 participants who are a part of TAG, right?

9 A Yeah, I believe a good number of companies are members
10 of TAG.

11 Q And one of the things that TAG does is you can apply to
12 have a brand safety certification; is that right?

13 A I believe that is correct. Brand safety is not my area
14 of expertise, but I believe they have that type of
15 certification.

16 Q Well, are you aware of whether Google seeks to have any
17 certifications from TAG about fraud and malware and things
18 like that?

19 A I believe it currently has three certifications from
20 TAG.

21 Q And the purpose of these certifications is to tell the
22 outside world, world meaning users, publishers, advertisers,
23 basically you can trust these companies, right?

24 A The purpose of the certification is to try to up level
25 everyone's ability to fight fraud in the case of ad fraud.

Cross-Examination - P. BJORKE

1 And they set -- they define some guidelines for what you
2 need to do, and it's kind of a minimum bar for what you need
3 to do. It is not a very effective certification, but it is
4 kind of a bear minimum certification.

5 Q And other companies that we have talked about, like
6 Index Exchange, has TAG certifications against fraud and
7 malware, right?

8 A I do not remember who has certifications. I think it's
9 publicly disclosed, but I don't remember exactly who has
10 what type of certifications from TAG.

11 Q Okay. Do you have the binder in front of you?

12 A I do.

13 Q Just to refresh your recollection, if you go to the Tab
14 2018.03.22 --

15 A Sorry. Can you repeat that?

16 Q Sure, 2018.03.22.

17 A Okay.

18 Q Great. In looking at this, this is that organization
19 that we've been talking about, TAG, in their 2018
20 announcement of recertification for antifraud, antipiracy,
21 antimalware, and transparency programs, right?

22 A Yes.

23 Q Okay. I want you to turn, then, to the second page of
24 that document. At the very top, it talks about the CO
25 recipients in 2018, right?

Cross-Examination - P. BJORKE

1 A Yes, I see that page too.

2 Q Okay. This is the kind of public announcement that you
3 were referring to about what companies have certifications
4 and which ones don't or -- or at least which ones do? I'm
5 sorry.

6 A I was referring to -- I think TAG published on their
7 websites, but this is probably a list derived from the
8 website. So probably the same list.

9 Q And you see in this announcement that in 2018, for
10 antifraud, antipiracy, antimalware, Index Exchange had it,
11 right?

12 A Yes, I see Index Exchange on the list.

13 Q OpenX?

14 A Yes.

15 Q Rubicon?

16 A Yes.

17 Q And Google is on that list as well with the rest of the
18 companies in the first column, right?

19 A Yes.

20 Q Okay. And Google would refer to -- and we will get to
21 the AWBid story -- but would refer to those type of
22 companies, Index Exchange, OpenX, and Rubicon, as
23 third-party exchanges; is that fair?

24 A That's correct.

25 Q Okay. Beyond these specific groups of like TAG and

Cross-Examination - P. Bjorke

1 IAB, at times industry participants communicate with each
2 other in real-time if they're seeing any sort of fraud or
3 malware, right?

4 A There are at times collaboration between individuals in
5 the industry in trusted manners to share intelligence when
6 we see attacks.

7 Q And at times, people email Google, like OpenX, to tell
8 them that they're seeing fraud or malware coming from
9 Google, right?

10 A Malware is not my area of expertise. I'm advertising.
11 But when it comes to fraud, yes, we have occasionally
12 companies report activities that look suspicious to us so we
13 can investigate it.

14 Q So you do remember occasionally other industry
15 participants -- let's just take OpenX for example --
16 contacting Google to say that they have detected some sort
17 of ad fraud coming from Google and to investigate further?

18 A I don't remember specifically OpenX, but I have
19 received -- we have received tips from other industry
20 participants about suspected fraud cases, and it has at
21 times been informative and helpful.

22 Q I do want to talk to you just briefly about AWBid,
23 which we just talked about on direct. AWBid, right, was
24 limited at least at its initial to remarketing, is that
25 right, remarketing inventory?

Cross-Examination - P. Bjorke

1 A Yes.

2 Q And you were shown some slide decks, but Google would
3 then test various third-party exchanges to determine things
4 like inventory quality and then also like spam click rates,
5 right?

6 A Yes.

7 Q I'm going to show you what's already been admitted PTX
8 199. It should be in your binder and will also be on the
9 screen too.

10 The title of this particular is AWBId Update, and this
11 is from September 2014, right?

12 A Yes.

13 Q If you go to page 12 of that document -- it will also
14 be on of your screen in case you don't want to flip through,
15 whichever is easier for you.

16 A Okay.

17 Q So this is a 2012 -- or 2014 AWBId looking at the
18 inventory quality of various third-party exchanges, right?

19 A Correct.

20 Q And Google found that in 2014, that the inventory
21 quality on third-party exchanges met AdX's policy ratings,
22 right?

23 A So this is talking about inventory --

24 Q Is that a yes or no?

25 A For inventory quality, yes.

Cross-Examination - P. BJORKE

1 Q Right. And specifically, you rate -- it's a policy
2 rating. You rate third-party exchanges as six out of ten
3 and then versus seven out of ten for AdX, right?

4 A For policies, yes.

5 Q So this is something that you initially agreed that
6 even this own policy rating of AdX indicates that AdX is not
7 perfect in this regard, right?

8 A For policies, yes.

9 Q Are you aware of other reports about, say, for example,
10 an analytics report from 2023 that stated Google violated
11 the wishes of companies by serving their ads on sanctioned h
12 entities in Iran?

13 A That is not my area of expertise, but I am somewhat
14 familiar with the report. But that's not my area of
15 expertise. That belongs to the AdSafety team.

16 MS. MORGAN: I'm sorry, Your Honor. Objection.

17 What's the date of the report you're referring to?
18 Is it before or after the close of discovery?

19 MR. FREEMAN: It's before.

20 MS. MORGAN: What's the date?

21 MR. FREEMAN: I don't have the precise date.

22 MS. MORGAN: Well, discovery was cut off in
23 September of 2023.

24 MR. FREEMAN: We can move on.

25 THE COURT: Let's move on.

Cross-Examination - P. Bjorke

1 BY MR. FREEMAN:

2 Q Are you familiar of a ProPublica investigation from
3 October 29, 2022, which found that Google through Google Ads
4 revenue was putting ads on sites, including prohibited sites
5 from Bosnia?

6 MS. MORGAN: Objection. Hearsay.

7 MR. FREEMAN: I said is he aware.

8 THE COURT: Overruled.

9 BY MR. FREEMAN:

10 Q Are you aware of that report?

11 A I don't remember that specific report. I probably read
12 it at the time, but I don't remember it right now.

13 Q Are you aware of the University of Michigan in 2021
14 finding that 48 percent of all ad traffic on fake news sites
15 came from Google?

16 A I'm not familiar with that report.

17 Q Then fast-forwarding to 2018, I'm going to show you
18 what's been marked, already admitted, PTX 835.

19 THE COURT: I think you're going backwards. You
20 said fast-forward.

21 MR. FREEMAN: I'm sorry. The previous --

22 THE COURT: I'm giving you a hard time.

23 MR. FREEMAN: I understand, Your Honor. That's
24 fair enough.

25

Cross-Examination - P. Bjorke

1 BY MR. FREEMAN:

2 Q Again, this is a 2018 AWBid review. Do you see that?

3 Are you with me?

4 A I see that, yes.

5 Q And if you go to the fourth page of that, there's a
6 chart that says, "AWBid Remarketing Growth," and there's a

7 note, though, that says, "Spam click rate comparable to
8 AdX," right?

9 A I see that.

10 Q At times Google, through their attempt to block invalid
11 traffic, also blocks valid traffic, right?

12 A Occasionally, yes, there will be some false positives
13 and occasionally blocked valid traffic. We incorrectly
14 think it's invalid traffic. That's correct. There will
15 also be some false positives.

16 Q There's times that Google will block inventory made
17 available to third-party exchanges but allow that same
18 inventory to be bid on on AdX, right?

19 A That can happen because we have different risk
20 profiles, different signals, different data. So it may
21 trigger a risk classification to lead us to block it on a
22 third-party exchange while on other networks we may believe
23 it's okay. It can also happen the other way around.

24 Q Do you remember specifically that the *Financial Times*
25 inventory, Google blocked that ability for it to be bid on

Cross-Examination - P. Bjorke

1 third-party exchanges but permitted inventory from the
2 *Financial Times* to be bid on on AdX?

3 A I don't remember that specific case. Do you have more
4 details?

5 Q Yeah. Sure. So in your binder in front of you --

6 MR. FREEMAN: We are not seeking to admit this,
7 Your Honor, just to refresh the recollection.

8 THE COURT: All right.

9 BY MR. FREEMAN:

10 Q It will be Bates Google, so GOOG-DOJ-13566376. So it
11 ends in 376.

12 Are you there?

13 A I am there, yes.

14 Q Okay. And at the very top is an email from you, and
15 then even surely below that is an email from you on
16 September 13, 2017.

17 Do you see that?

18 A Yes.

19 Q And your summary that you have is that the ft.com,
20 FinancialTimes.com, was selling inventory through AdX and
21 through a third-party exchange, that being TrustX or
22 BidSwitch. Do you see that?

23 A Yeah.

24 Q I'm not going to read the whole thing, but the net
25 result is it appears that DBM, which we've already

Redirect Examination - P. BJORKE

1 established is DV360, is accepting inventory when coming via
2 AdX but blocking it when it comes through the third-party
3 exchange of TrustX, right?

4 A That's what the email is saying, yes.

5 Q And you have a note, then, just above your summary that
6 this implies that DBM or DV360 is giving AdX preferential
7 treatment, right?

8 A Let me see. Where do you say that was?

9 Q Just right above your summary, the last clause right
10 above your summary.

11 A Oh, yes, I see it.

12 MR. FREEMAN: I have nothing further, Your Honor.

13 Thank you.

14 THE COURT: All right. Redirect?

15 MS. MORGAN: I'll be very brief, Your Honor.

16 REDIRECT EXAMINATION

17 REDIRECT EXAMINATION

18 BY MS. MORGAN:

19 Q First, I want to go to PTX 199, which is one of the
20 documents that you were shown.

21 Do you see the date on this document?

22 A Yes, 2014.

23 Q Is that from before the launch of AWBid?

24 A That was during a time they were experimenting with
25 AWBid. I believe it was before they fully launched AWBid.

Redirect Examination - P. Bjorke

1 Q Okay. At this point, how much traffic had actually
2 been reviewed that flowed through AWBid?

3 A I am -- I think it was experiment traffic, maybe
4 1 percent on a few exchanges. I don't remember exactly how
5 much they bid on at that point in time.

6 Q Okay. And you were shown a slide that ends in the
7 No. 7240 in this deck. My colleague here cut you off when
8 you were describing what inventory quality is. Can you
9 describe for the Court what this is referring to?

10 A Yeah. So if you look at the table there in the middle
11 of the screen, you will see the types of policies. This is
12 inventory quality from a policy perspective. Are you
13 monetizing web money, which was not policy compliant; are
14 you monetizing copyrighted content; are you monetizing
15 sexual content, desktop app, and things like that. This is
16 not about invalid traffic. This is about policy compliance.

17 In fact, if you look at the next slide in that deck,
18 it's talking about the invalid traffic aspect.

19 Q Okay. And what is this showing?

20 A This is showing the percentage of traffic at this point
21 with the analysis and experiments it was running and how
22 much invalid traffic we had there. The online column shows
23 how much our automated detection is catching, and it hadn't
24 been updated very much, so it didn't catch an awful lot.

25 And then the offline was what we found from the manual

Redirect Examination - P. Bjorke

1 analysis in addition to the automated systems.

2 And if you look at one there, we had 100 percent
3 invalid traffic, and a couple of them didn't have enough
4 traffic because it was early stages. So they hadn't ramped
5 up enough. There's clearly issues here in terms of invalid
6 traffic that needed further work and further defenses.

7 MS. MORGAN: Okay. You can go ahead and take that
8 down.

9 BY MS. MORGAN:

10 Q You were also shown a document related to AWBid from
11 2018. Do you remember that?

12 A Can you refresh my memory, please?

13 Q We can. What's -- it's PTX 835. I am just going to
14 show you the first page here. What's the date on this
15 document?

16 A This is September 2018.

17 Q And at this point, had your team already implemented
18 several protections in order to bring spam clicks down from
19 third-party exchanges?

20 A Yes, at that point. So this is four years later. We
21 had made good progress on building out the integrations,
22 building out the defenses necessary and so forth.

23 MS. MORGAN: Okay. We can take that down.

24 BY MS. MORGAN:

25 Q And then the last document I want to ask you about is

Redirect Examination - P. BJORKE

1 one that was in the government's binder. It's at Bates
2 No. 13539879.

3 A I may need help finding that one.

4 Q It's one of the Bates stamped tabs. I think it's -- I
5 don't know. It has that number on it with the last four
6 digits 9879.

7 A 9879. Okay, I found it I think.

8 Q Do you see it in -- it's unfortunately in the middle of
9 the binder.

10 A Yeah. Is that an email?

11 Q Yes, it's an email.

12 Do you remember being asked some questions about your
13 participation in the fight against ad fraud?

14 A I probably need more context on that.

15 Q Okay. Well, here, let me just ask you a question about
16 this document.

17 At the bottom of your email here, it says, "P.S. Want
18 to join the good fight against ad fraud? Join our PM team.
19 We are hiring and MTV." What are you saying there?

20 A Oh, it's just an internal job hiring ad, so to speak,
21 that we were promoting with people internally at Google. If
22 you want to join us in our fight against ad fraud, we had an
23 open position on our team.

24 MS. MORGAN: Okay. I have no further questions.

25 THE COURT: Any recross?

Recross-Examination - P. Bjorke

1 MR. FREEMAN: Just briefly.

2 RECROSS-EXAMINATION

3 RECROSS-EXAMINATION

4 BY MR. FREEMAN:

5 Q In that last document that they showed you, it shows
6 that third-party exchanges were also regularly scanning
7 creatives for malware, other quality issues, right? It says
8 OPenX does?

9 A Is that in this email?

10 Q That's correct.

11 A Okay.

12 Q So you agree that third-party exchanges were also doing
13 similar things to Google by scanning the inventory for
14 malware and other quality issues, right?

15 A So malware scanning is not my area of expertise, and I
16 don't know a lot about what everyone is doing in that space.

17 Q Right. But at least in this email that you are on,
18 that you saw, it shows that OpenX is regularly doing that?

19 A Let me scan through the email.

20 THE COURT: It's the bottom paragraph.

21 THE WITNESS: Oh, yeah. I see that the OpenX
22 author is saying that OpenX regularly scans creatives for
23 malware. Yes, I see that in the original email from
24 August 16.

25 MR. FREEMAN: Nothing further, Your Honor.

Recross-Examination - P. Bjorke

1 THE COURT: All right. Does anybody anticipate
2 calling this witness again?

3 MS. MORGAN: We do not, Your Honor.

4 MR. FREEMAN: No, Your Honor.

5 THE COURT: Sir, you are free to watch the
6 proceedings now. Just don't discuss your testimony with any
7 witness who has not yet testified.

8 Thank you.

9 All right. I think we have 15 minutes before we
10 end for today. So do you want to start with the next
11 witness?

12 MS. DUNN: Your Honor, next our plan was to call
13 Kenneth Blom via video. The video will exceed the time from
14 now until 4:30, but we can certainly start it if the Court
15 is open to that.

16 THE COURT: How long is it going to take?

17 MS. DUNN: It's a 29-minute video. So we can get
18 through half of it.

19 THE COURT: Yeah. Let's go ahead and get it
20 started.

21 MS. DUNN: Thank you, Your Honor.

22 Your Honor, we will hand up the binder.

23 THE COURT: All right.

24 MS. DUNN: Your Honor, there's a pause in the
25 video when you get to a sealed portion. So just to make

Read-In Deposition -

1 sure to tell the Court.

2 THE COURT: All right.

3 MS. DUNN: And just also for the record, this is
4 the designations with the least amount in dispute. So we're
5 just going to play it while the team comports with Your
6 Honor's request of this morning.

7 THE COURT: All right.

8 (Counsel confer.)

9 (The video deposition of Kenneth Blom is played.)

10 THE COURT: We need to stop here so we can finish
11 getting the exhibits read into the record.

12 Tomorrow morning I have nothing in court, so we
13 can start at 9:00, and you don't need to change anything on
14 your tables. All right.

15 MS. DUNN: Yes, Your Honor.

16 One question -- and I already flagged this for
17 plaintiffs about the lead-off witness tomorrow morning.
18 Previously I believe Your Honor had a conversation about
19 witness Adam Stewart. Adam Stewart has a medical issue.

20 THE COURT: Have we given him the authorization?

21 MS. DUNN: I believe so, and we'll check.

22 My question is as follows: I believe Your Honor
23 had said he should come in at 9:00. Due to the tetras like
24 effort of scheduling, we would like to lead off tomorrow
25 morning with our take rate expert, Professor Chevalier, and

1 follow her with Mr. Stewart. And I just wanted to make sure
2 that was okay with the Court.

3 THE COURT: That's all right.

4 MS. DUNN: Thank you, Your Honor, and I'll check
5 on the authorization.

6 THE COURT: So tomorrow morning there's going to
7 be just live witnesses?

8 MS. DUNN: Yes, Your Honor.

9 THE COURT: That's good for planning purposes.
10 All right. So let's get the exhibits into the
11 record.

12 THE COURTROOM DEPUTY: DTX 2536; DTX 2077 and
13 2077A; DTX 117, pages 115 to 148 only; DTX 405; DTX 578; DTX
14 2085 and 2085A; DTX 705; DTX 298; PTX 528; PTX 308; DTX 308;
15 PTX 1674; DTX 635; DTX 476. That's all.

16 THE COURT: Does that comport?

17 MS. WOOD: Yes, that's what we have as well, Your
18 Honor.

19 THE COURT: Again, just as a repeat, the demos are
20 all also being shown to the public, correct?

21 MS. DUNN: The demonstratives, yes.

22 THE COURT: All right. At some point, we probably
23 want just a nice clean list of those. All right. We don't
24 have to worry about that now.

25 All right. Anything further before we recess for

1 the evening?

2 MS. WOOD: I would just ask defense counsel.

3 I know we'll have Professor Chevalier first and
4 then Stewart. But if you know the rest of your witnesses
5 for tomorrow, that would be helpful.

6 MS. DUNN: I will -- let me --

7 THE COURT: You-all can do that.

8 MS. DUNN: I will not take the Court's time, and
9 we will --

10 THE COURT: Just remember the schedule tomorrow is
11 a little bit different. Lunch will be at noon. So it's a
12 noon to 1:00 lunch break, and the afternoon will be a little
13 bit longer because it's an extra hour. Okay.

14 We recess court for the evening.

15 MS. DUNN: Thank you, Your Honor.

16 (Proceedings adjourned at 4:29 p.m.)

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23 I certify that the foregoing is a true and
24 accurate transcription of my stenographic notes.

25

/s/
Rhonda F. Montgomery, CCR, RPR